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**Hashiguchi**

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(54) **CONNECTOR MATEABLE WITH A MATING CONNECTOR AND INCLUDING A CONTACT WITH A NARROW PORTION TO ACHIEVE A REDUCED CONTACT WIDTH**

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**H01R 13/24** (2006.01)  
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(52) **U.S. Cl.**  
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(58) **Field of Classification Search**  
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(Continued)

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*Primary Examiner* — Tulsidas C Patel

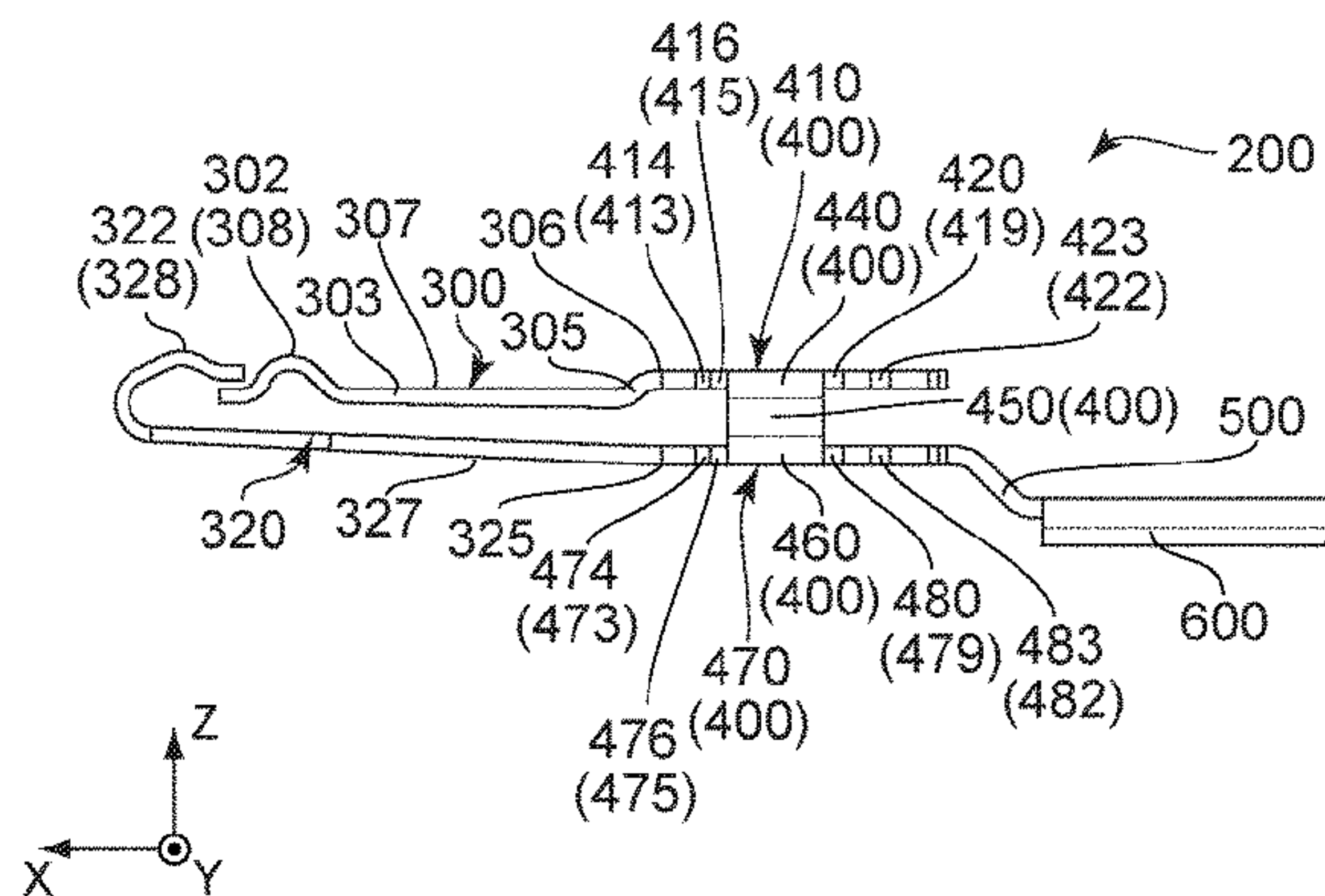
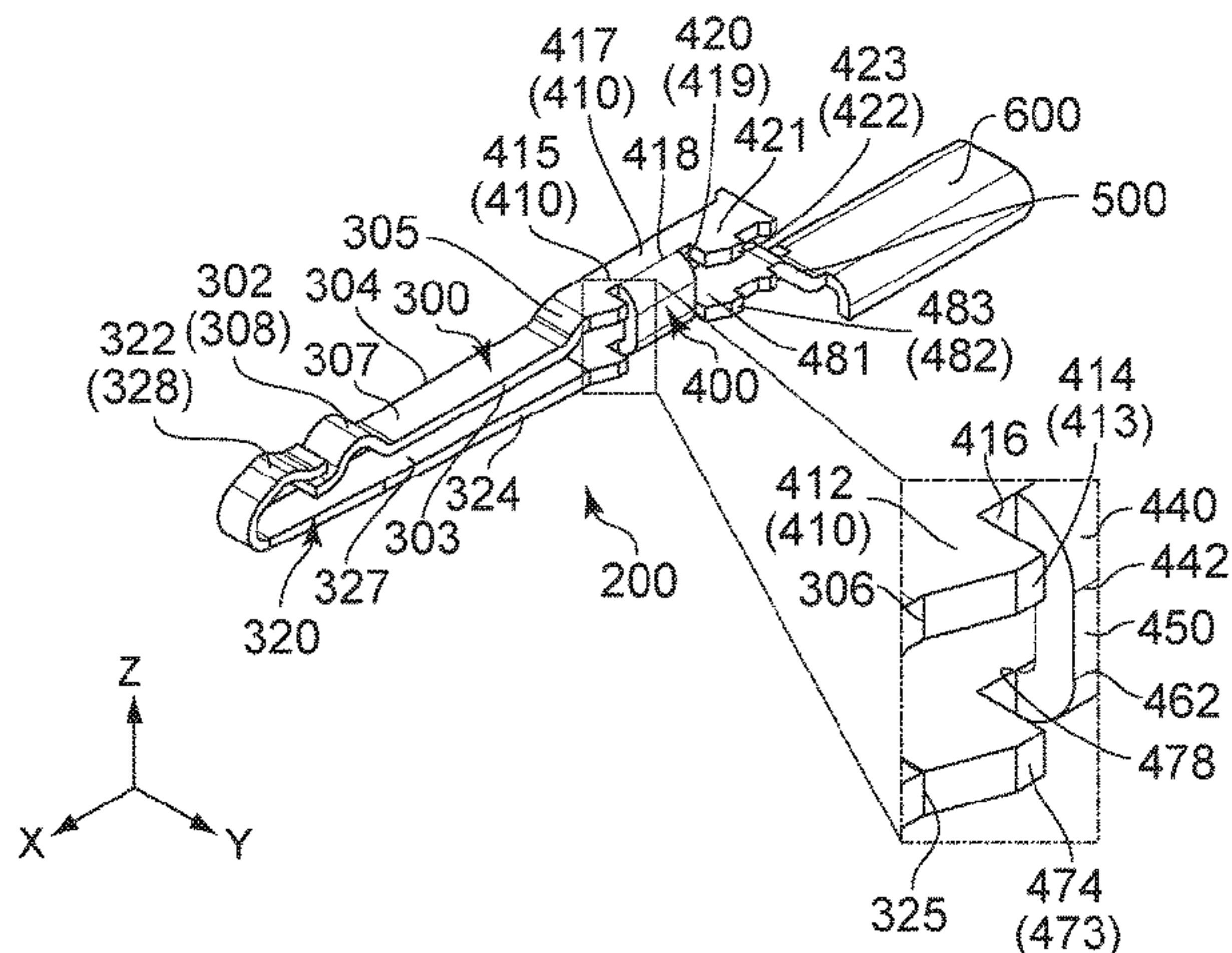
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(57) **ABSTRACT**

A connector is mateable with a mating connector along a front-rear direction. The connector comprises at least one contact and a holding member. The at least one contact has a first support portion, a second support portion, a first contact portion, a second contact portion and a coupling portion. The first support portion has a first edge in a width direction. The coupling portion has an upper main portion and an upper bent portion. The upper main portion has an upper front wide portion, an upper front narrow portion and an upper base portion. The upper front narrow portion has an edge facing a first orientation. The at least one contact has a first boundary portion between the first edge of the first support portion and the upper front wide portion in the front-rear direction. The edge of the upper front narrow portion is positioned beyond the first boundary portion in a second orientation.

**6 Claims, 15 Drawing Sheets**



(51) **Int. Cl.**

*H01R 13/415* (2006.01)

*H01R 107/00* (2006.01)

(58) **Field of Classification Search**

USPC ..... 439/862, 856

See application file for complete search history.

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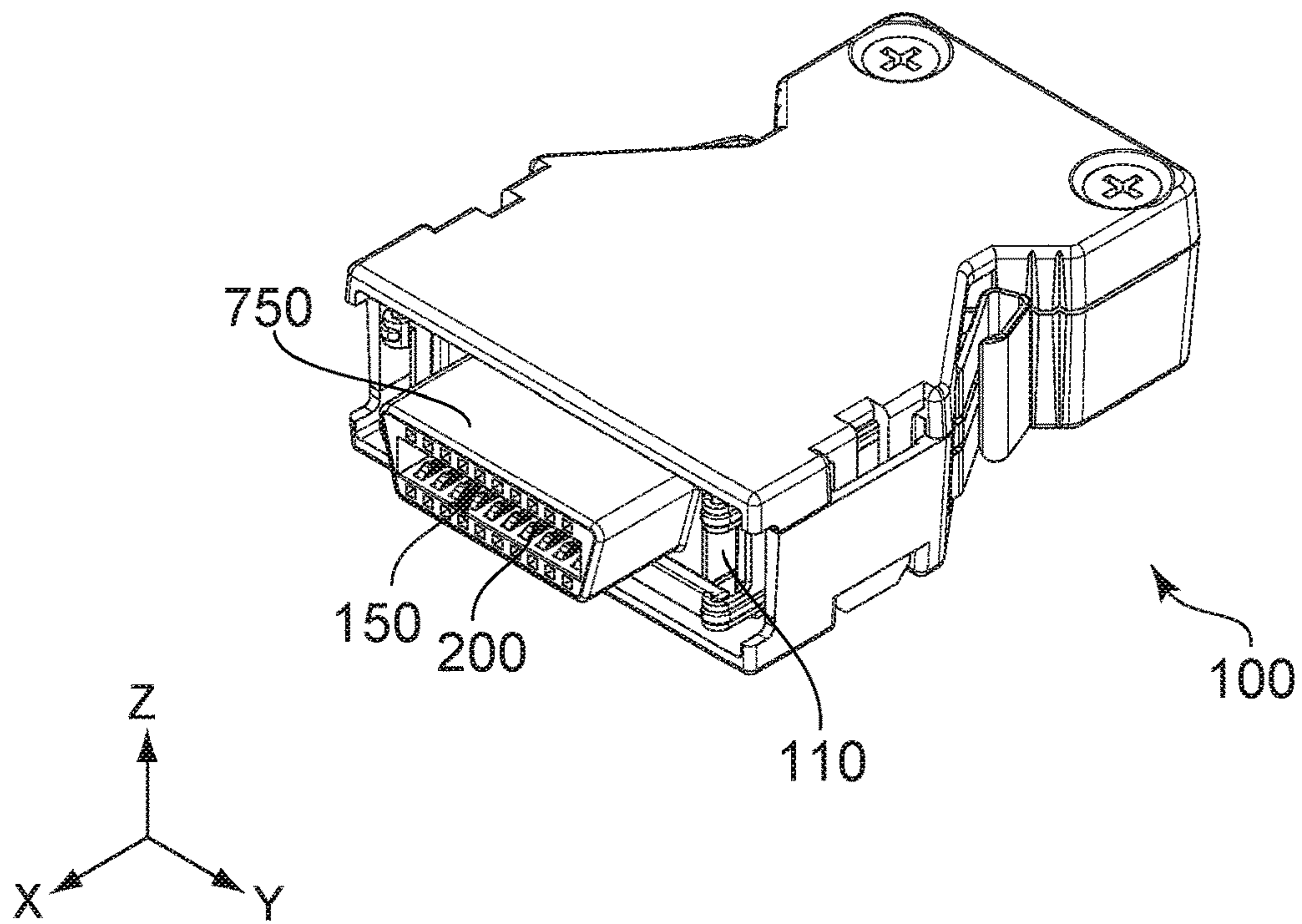


FIG. 1

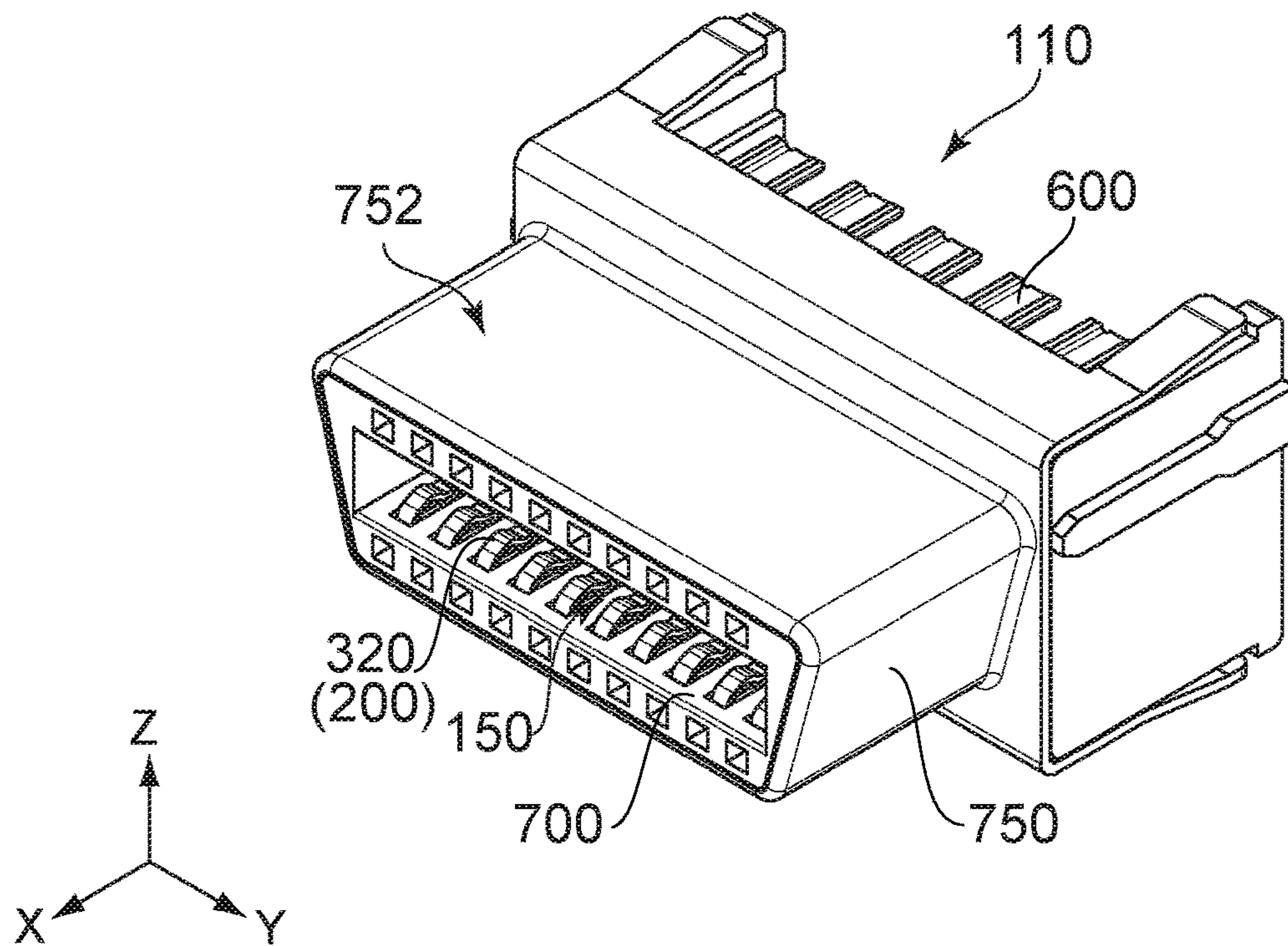


FIG. 2



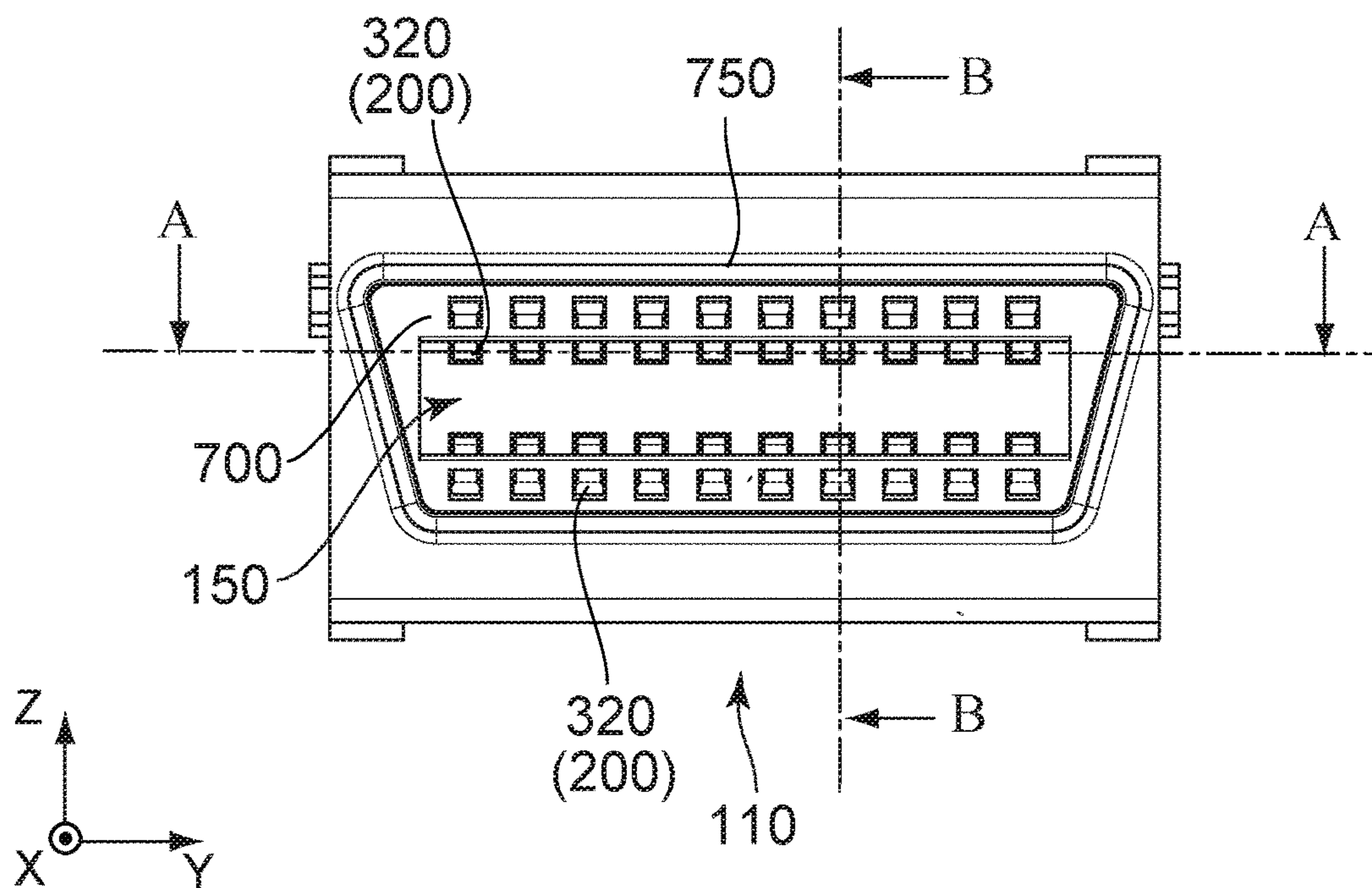


FIG. 3

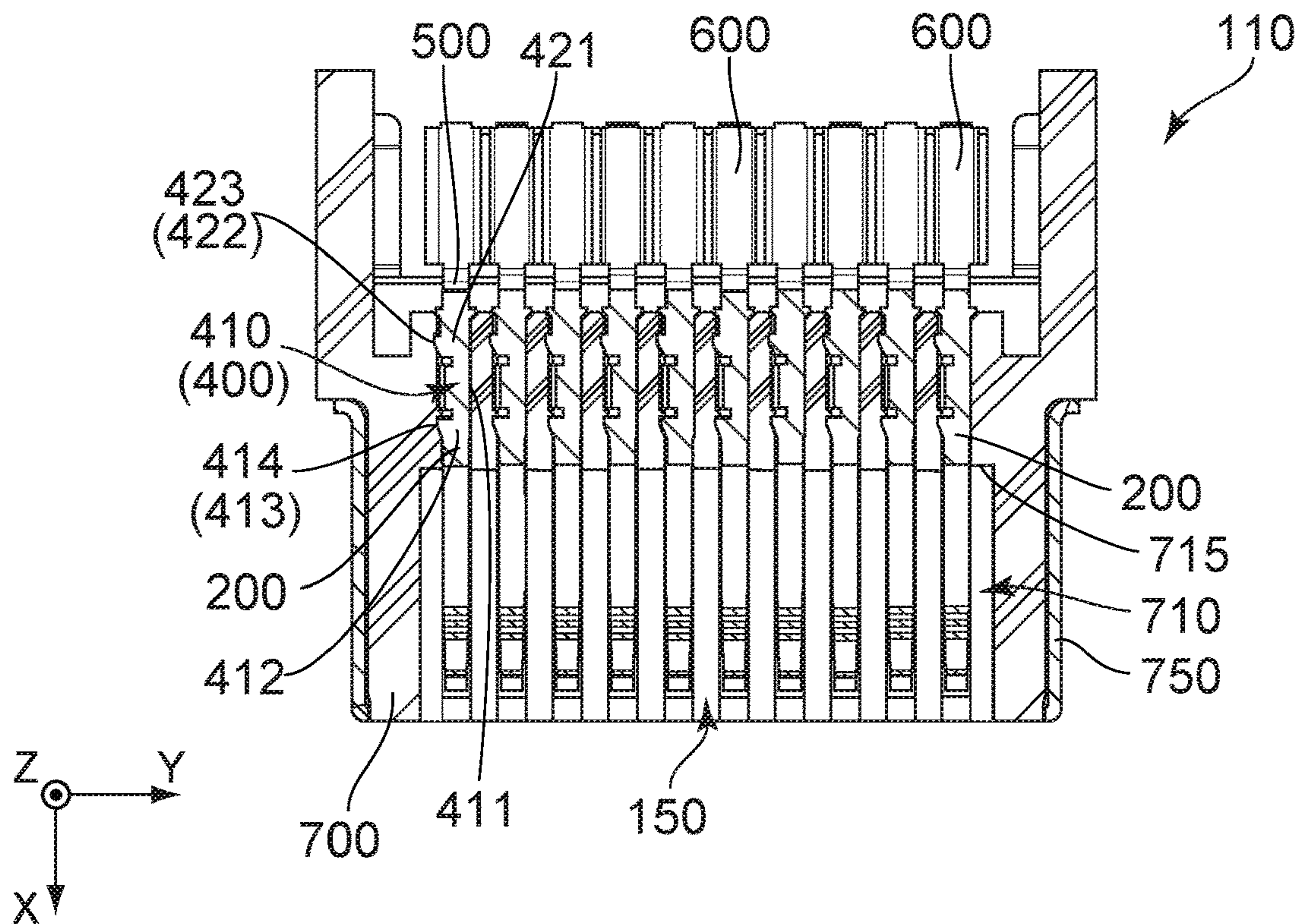


FIG. 4

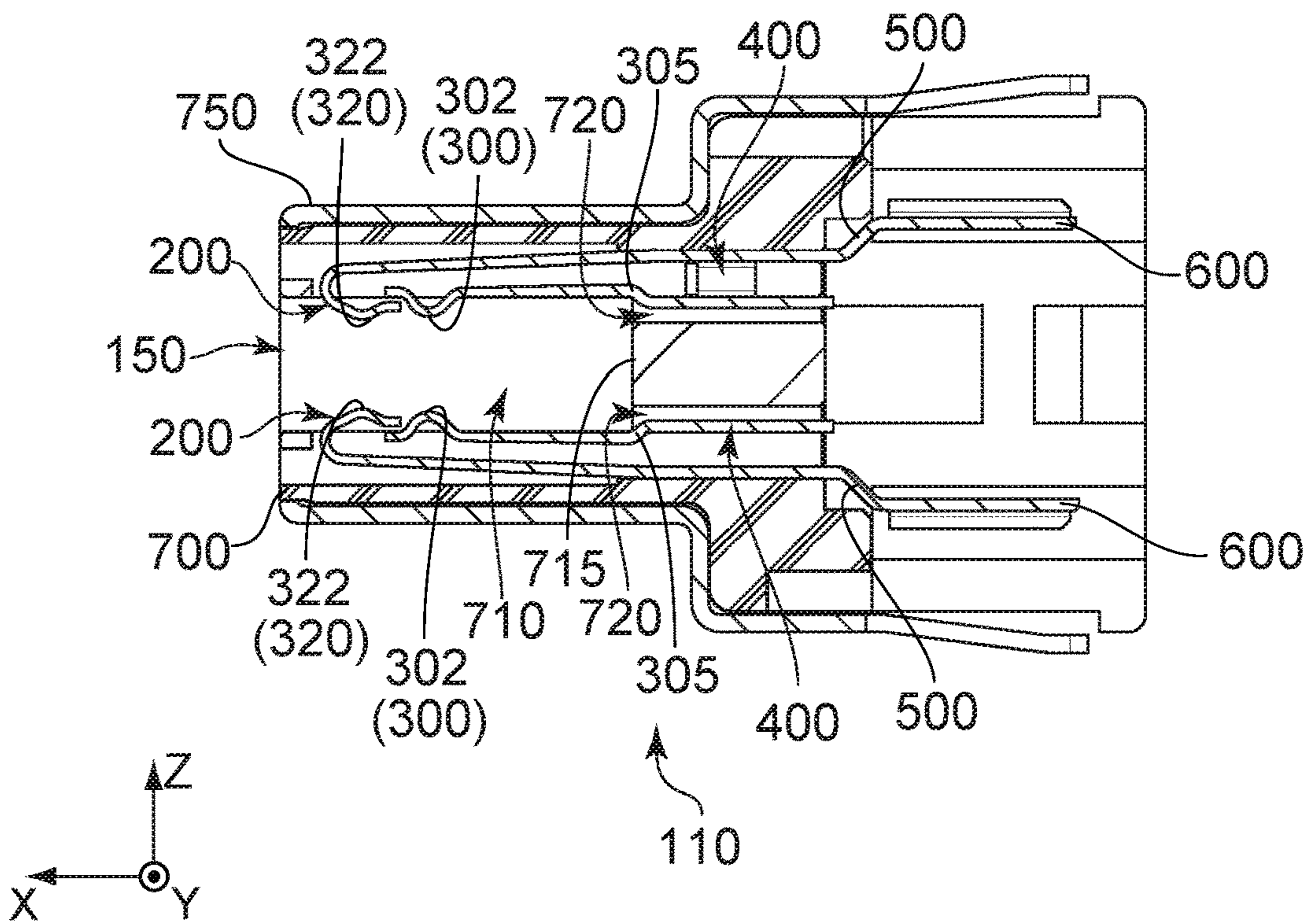


FIG. 5

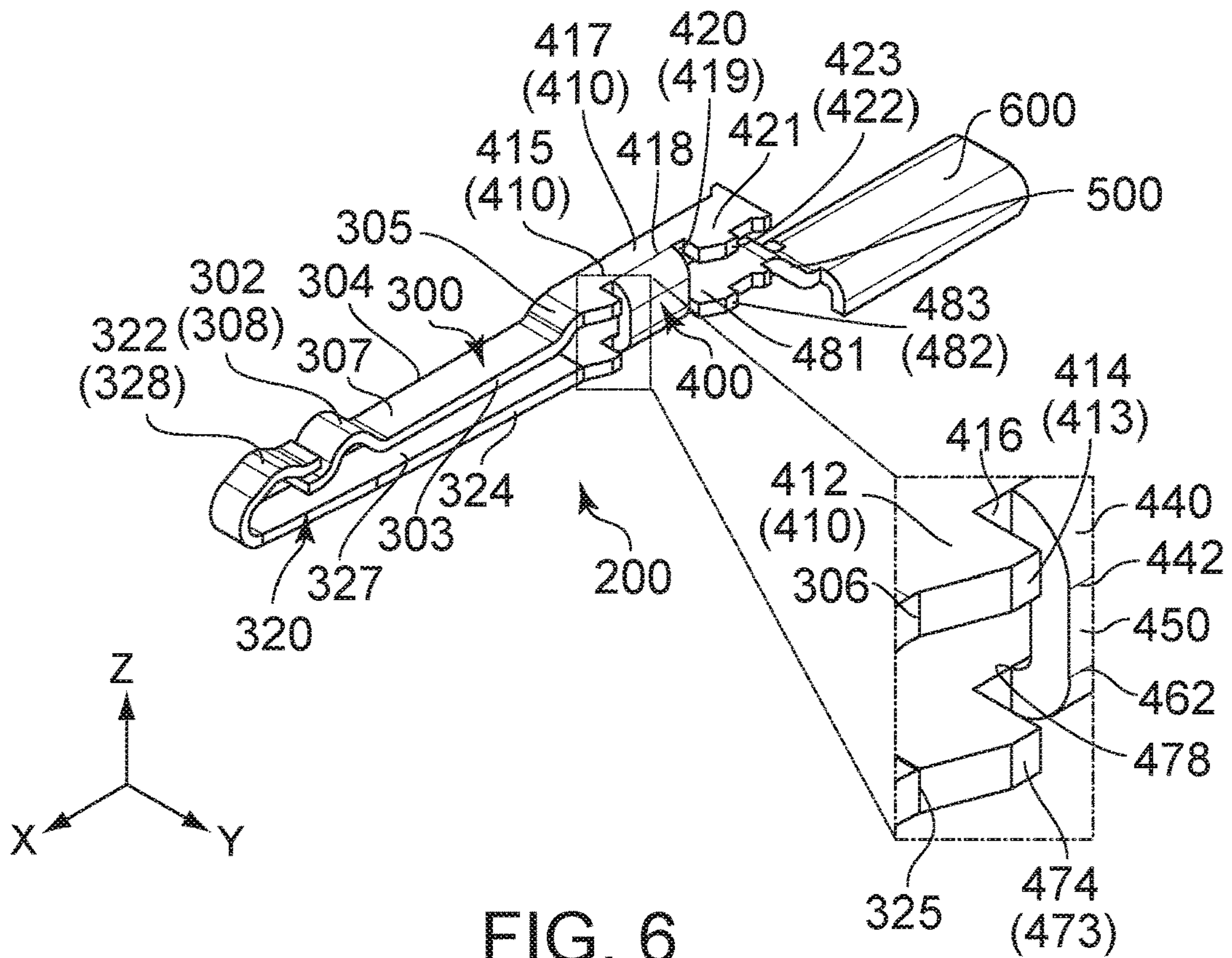


FIG. 6



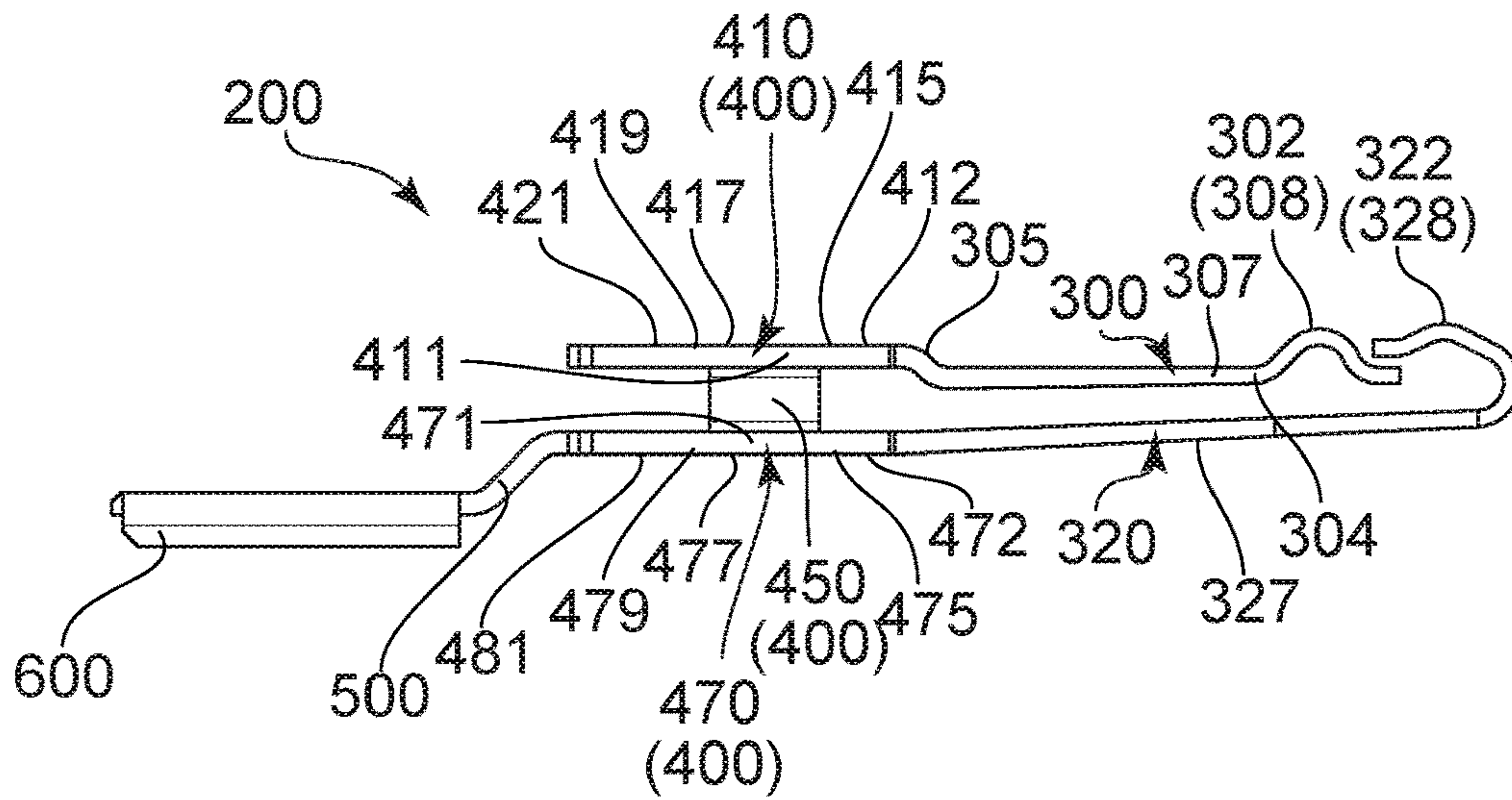


FIG. 7

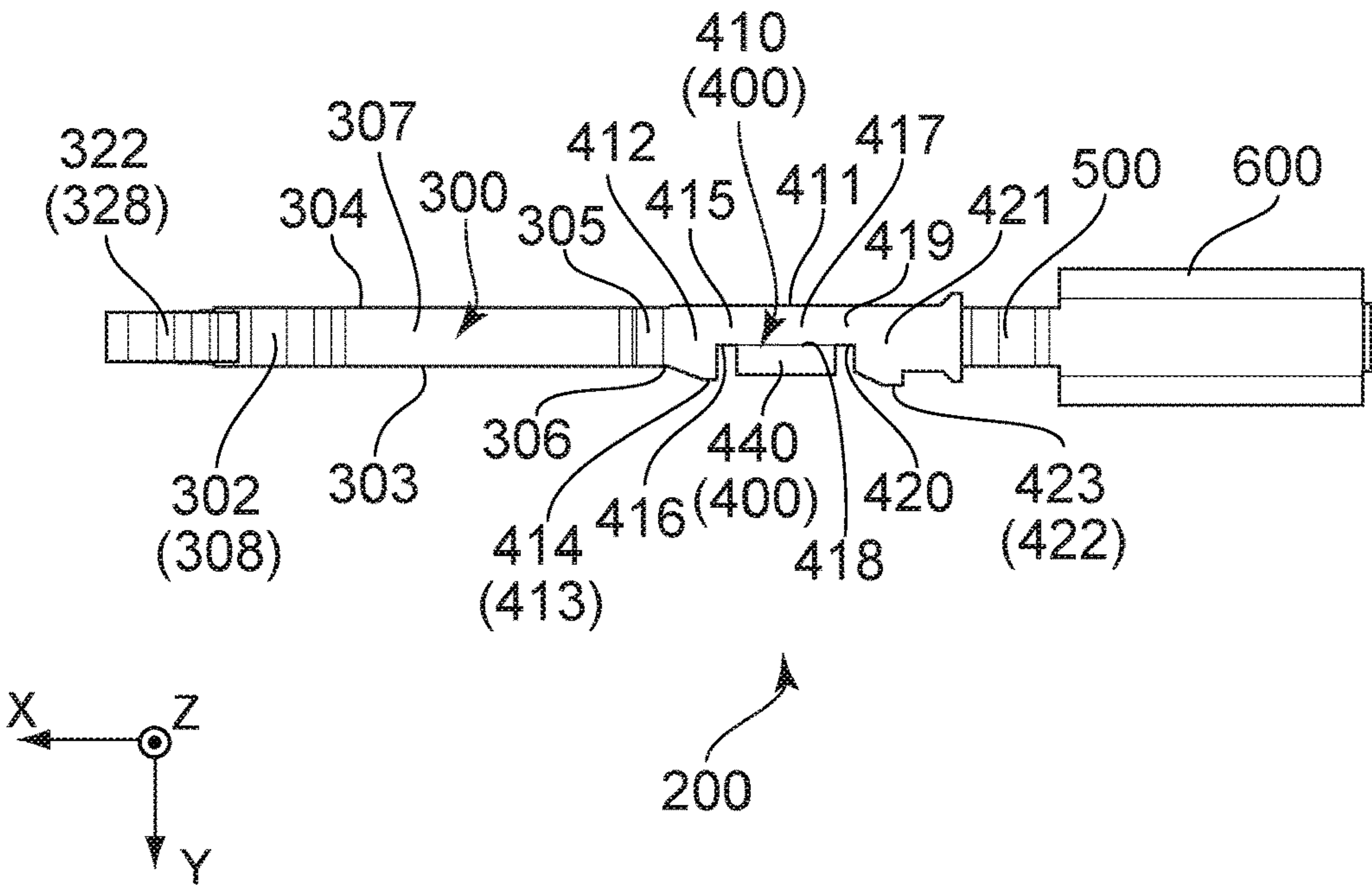


FIG. 8

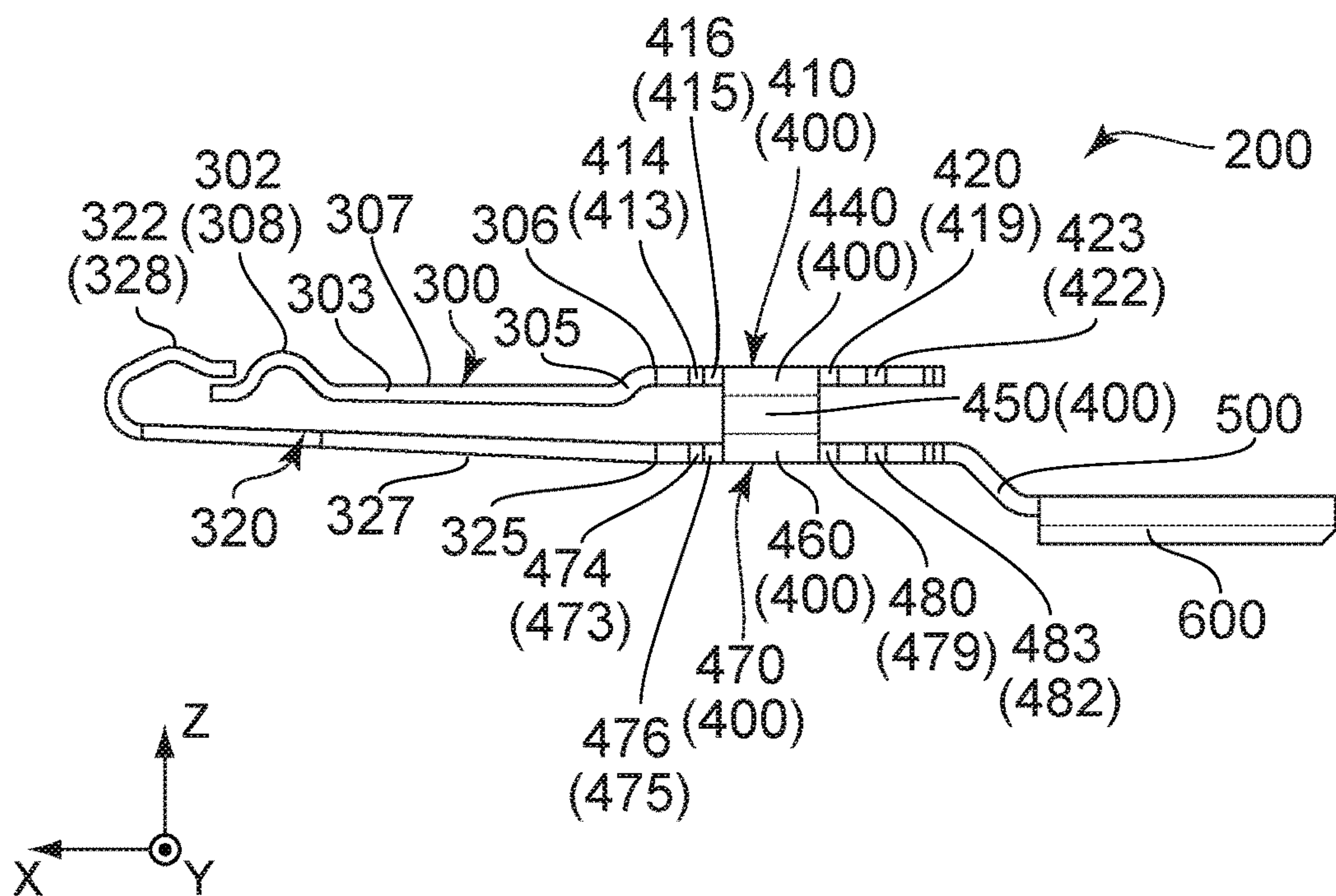


FIG. 9

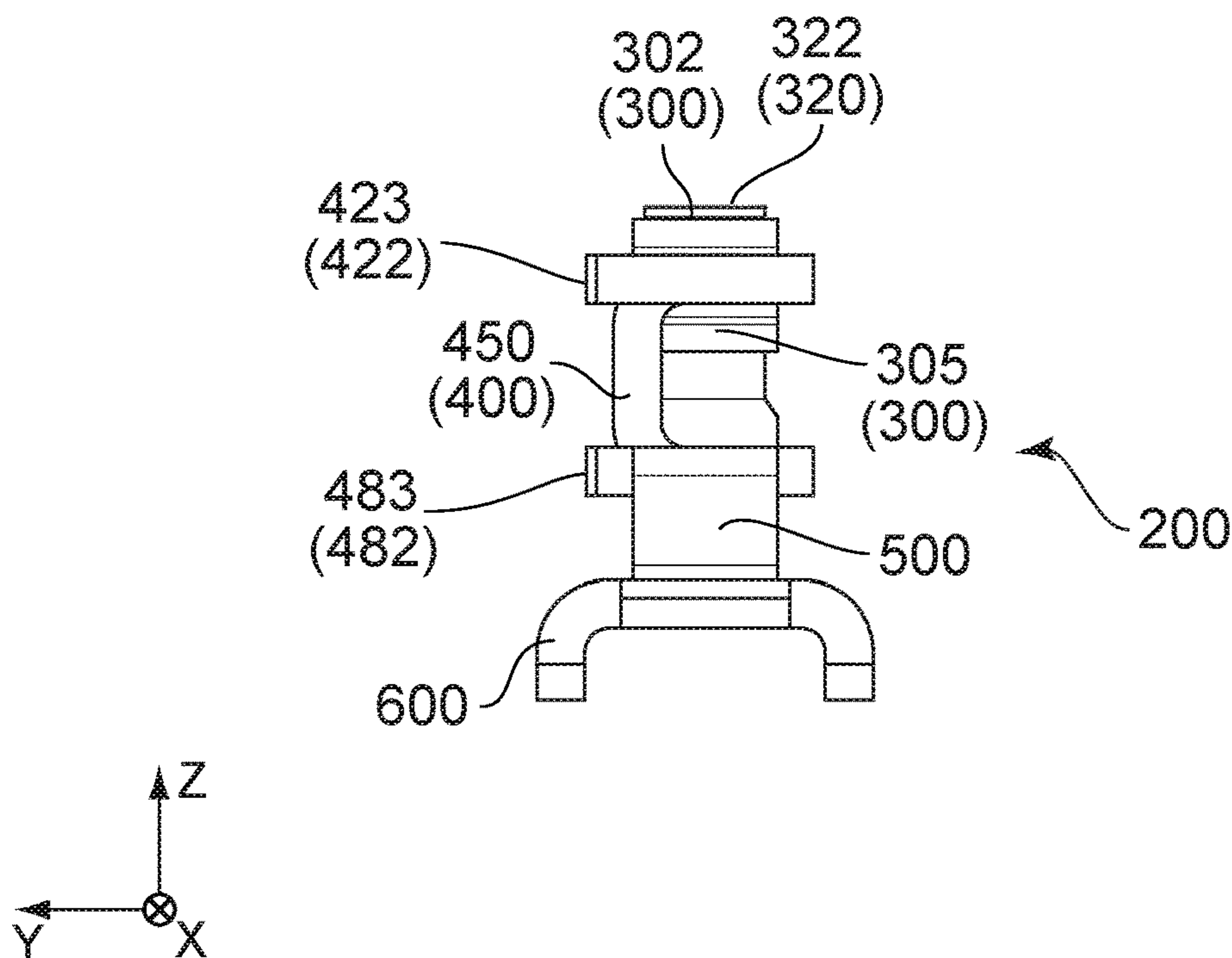


FIG. 10

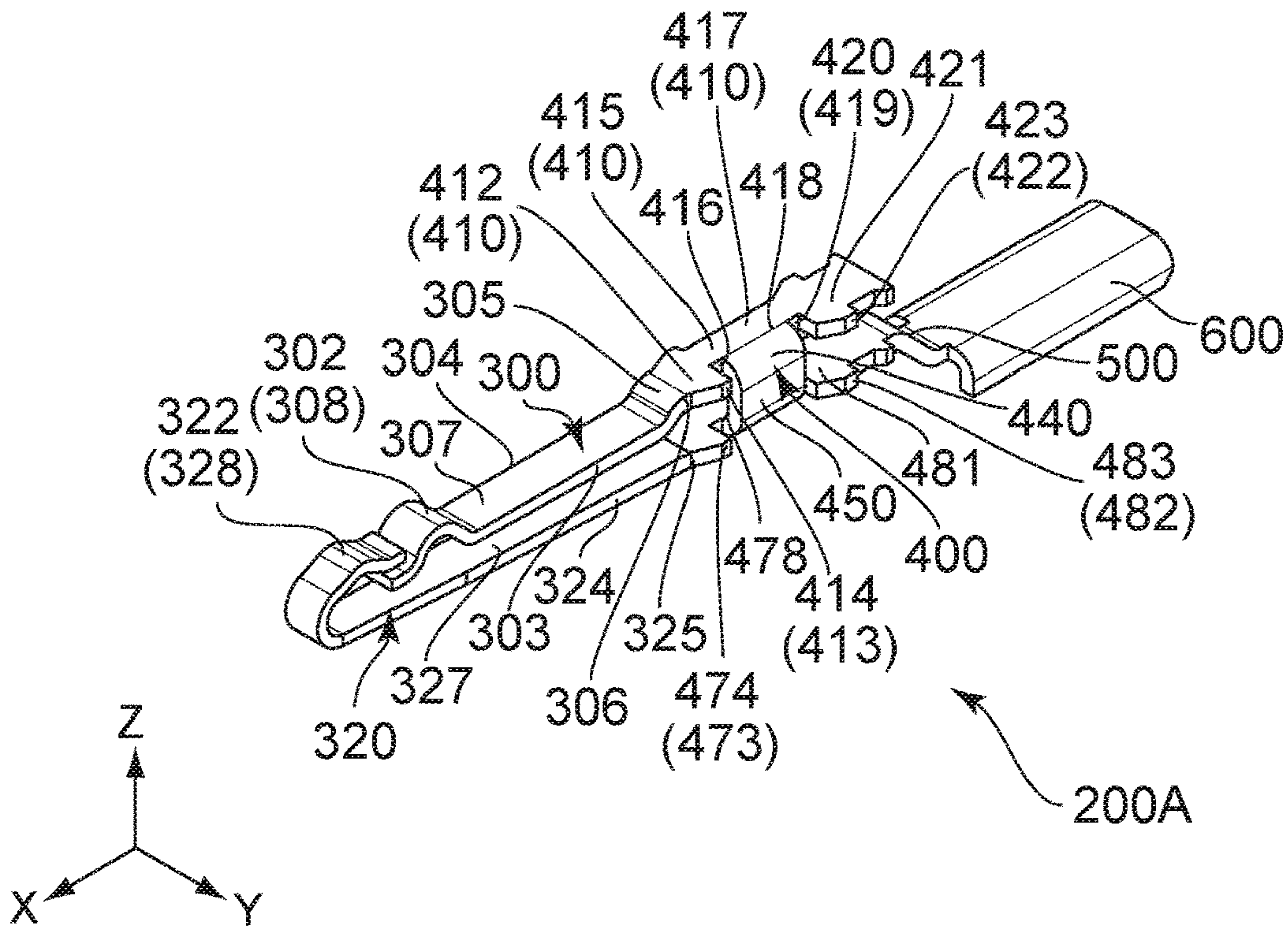


FIG. 11

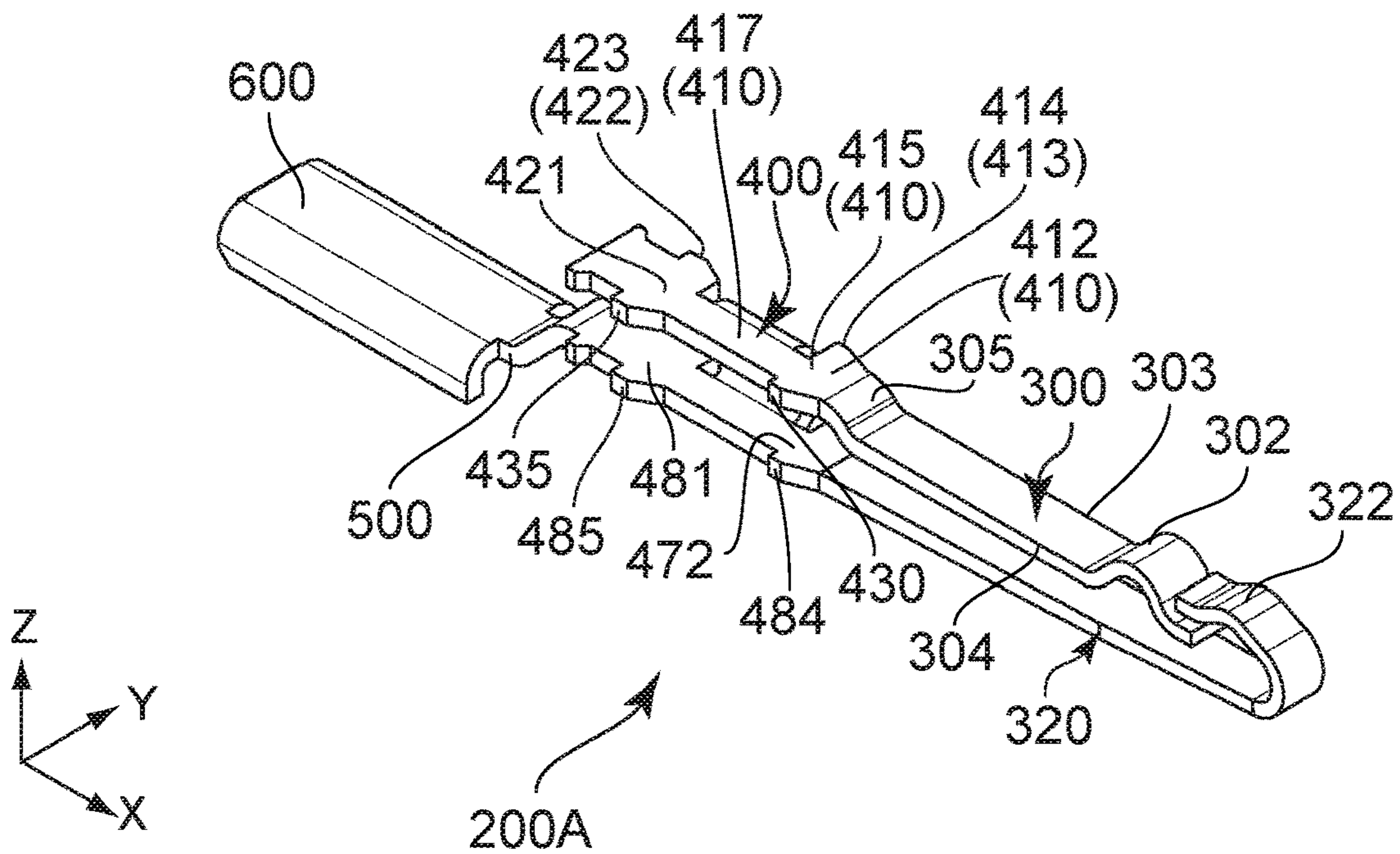


FIG. 12



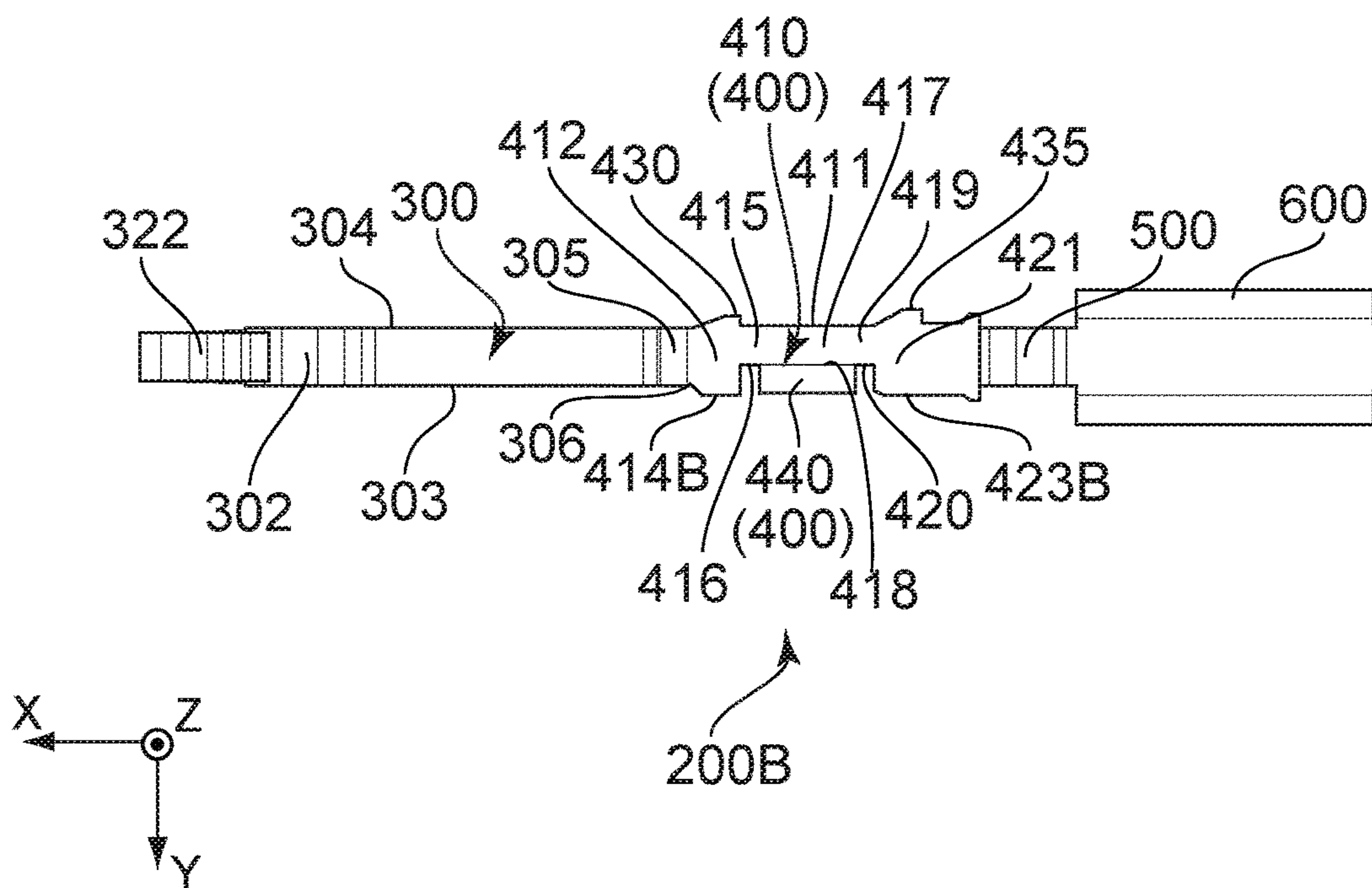


FIG. 13

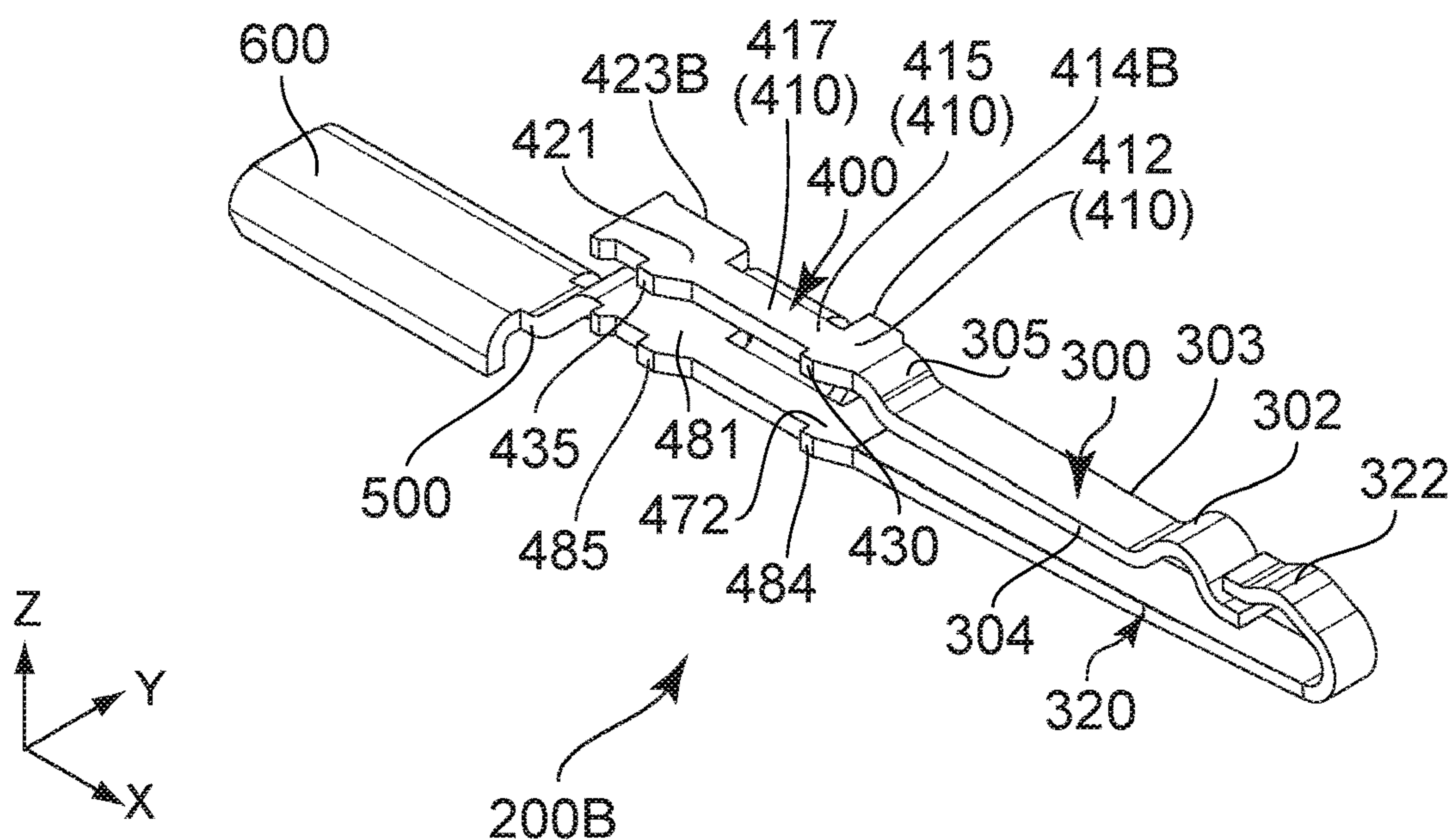


FIG. 14

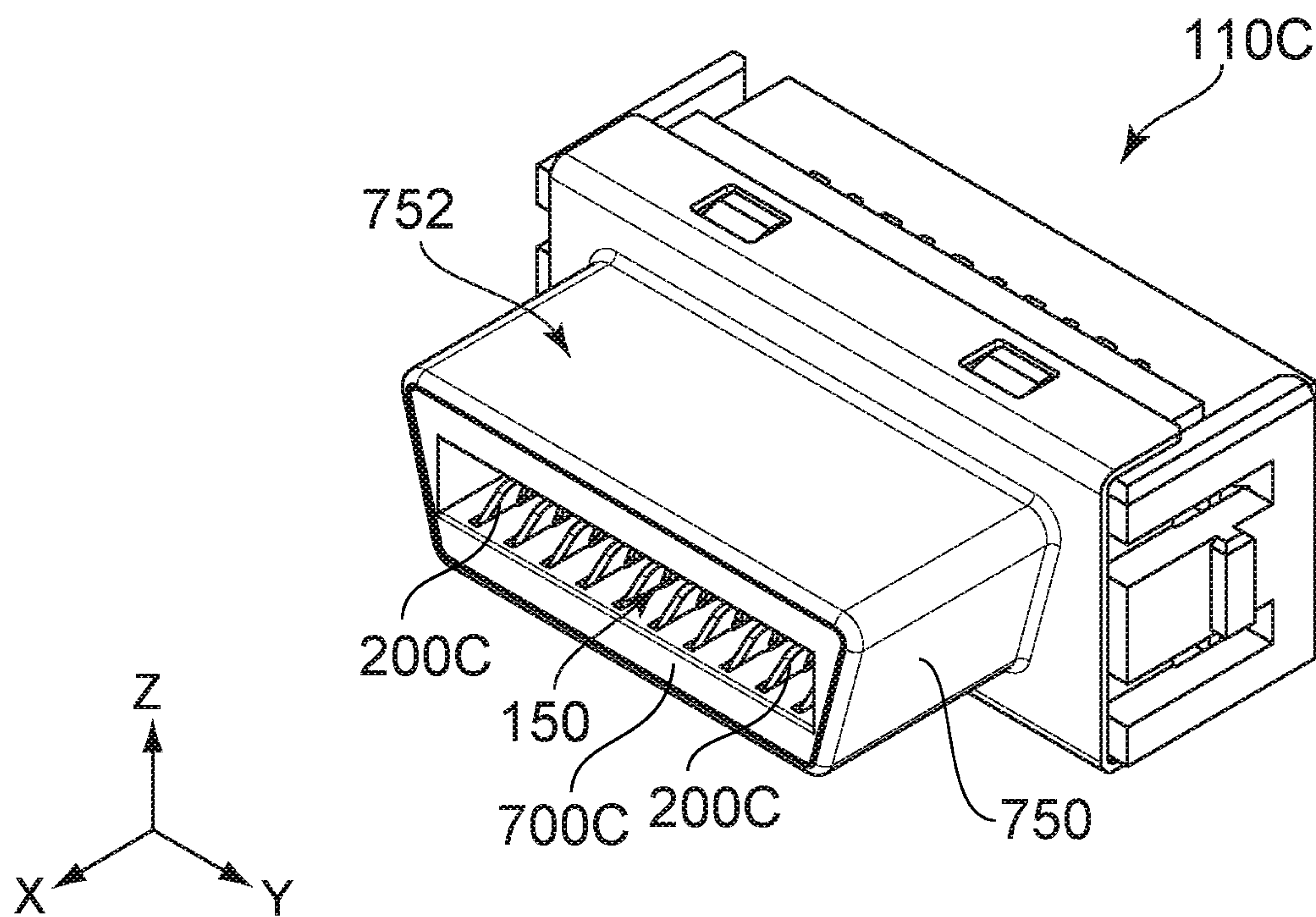


FIG. 15

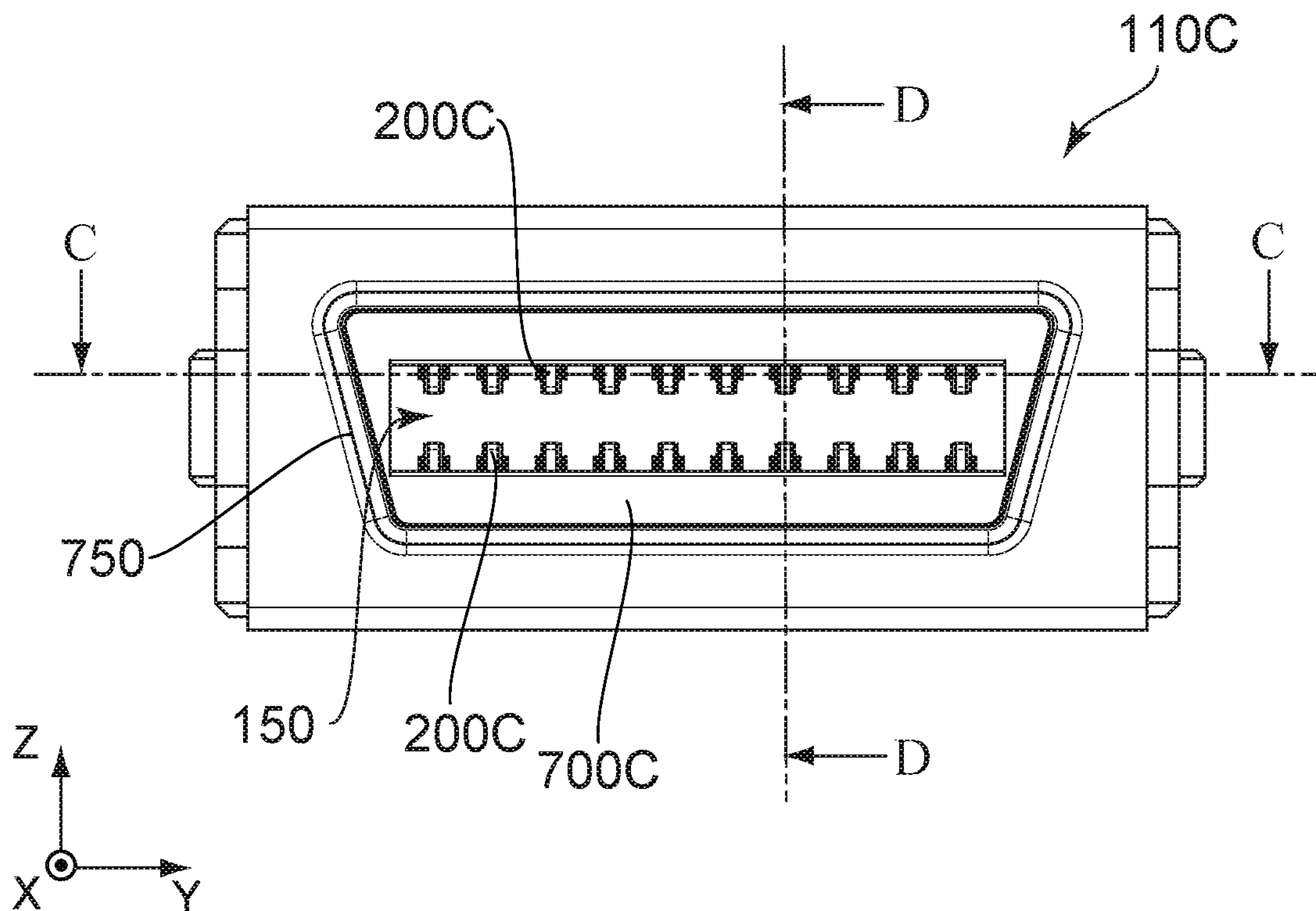


FIG. 16



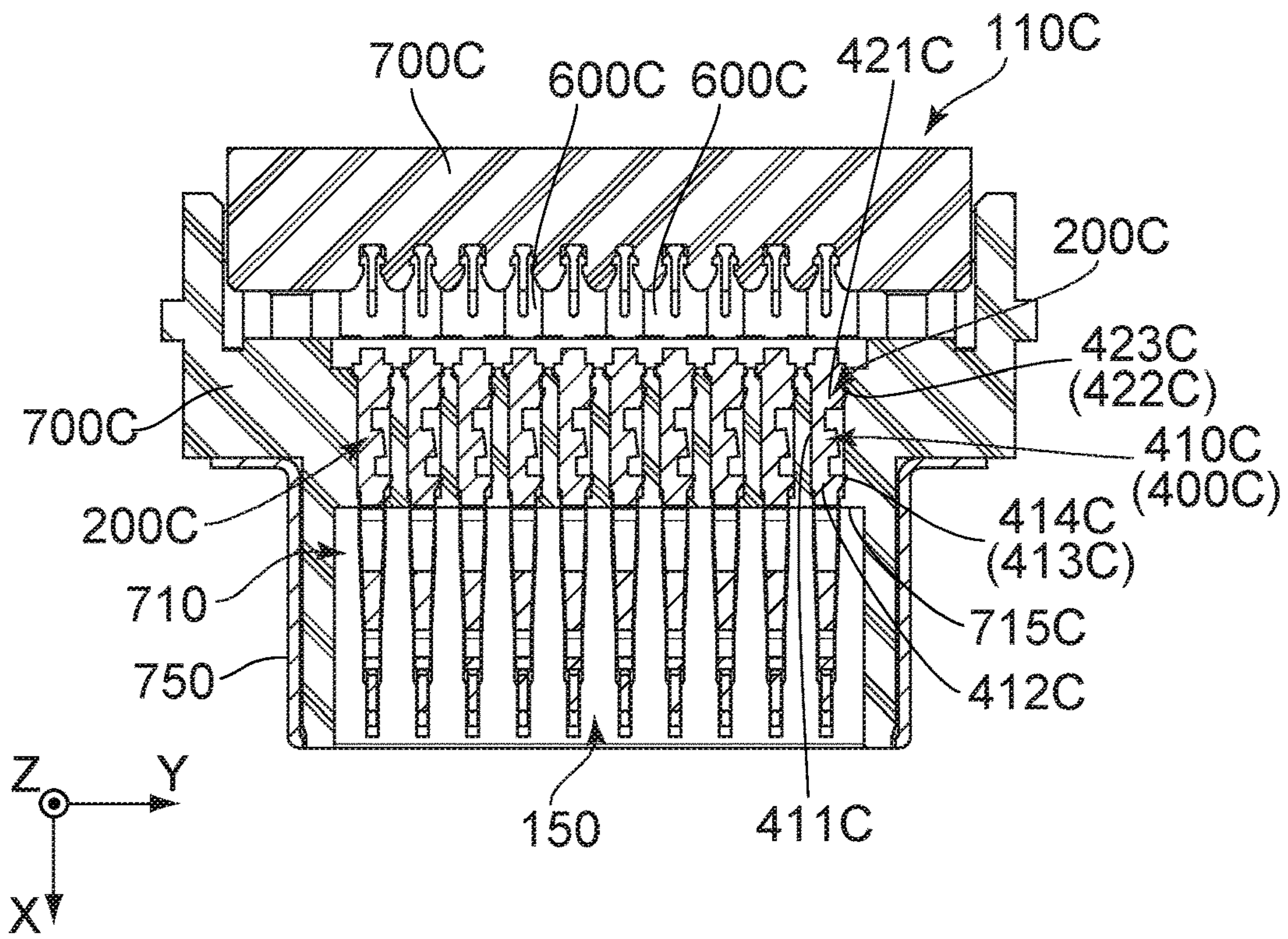


FIG. 17

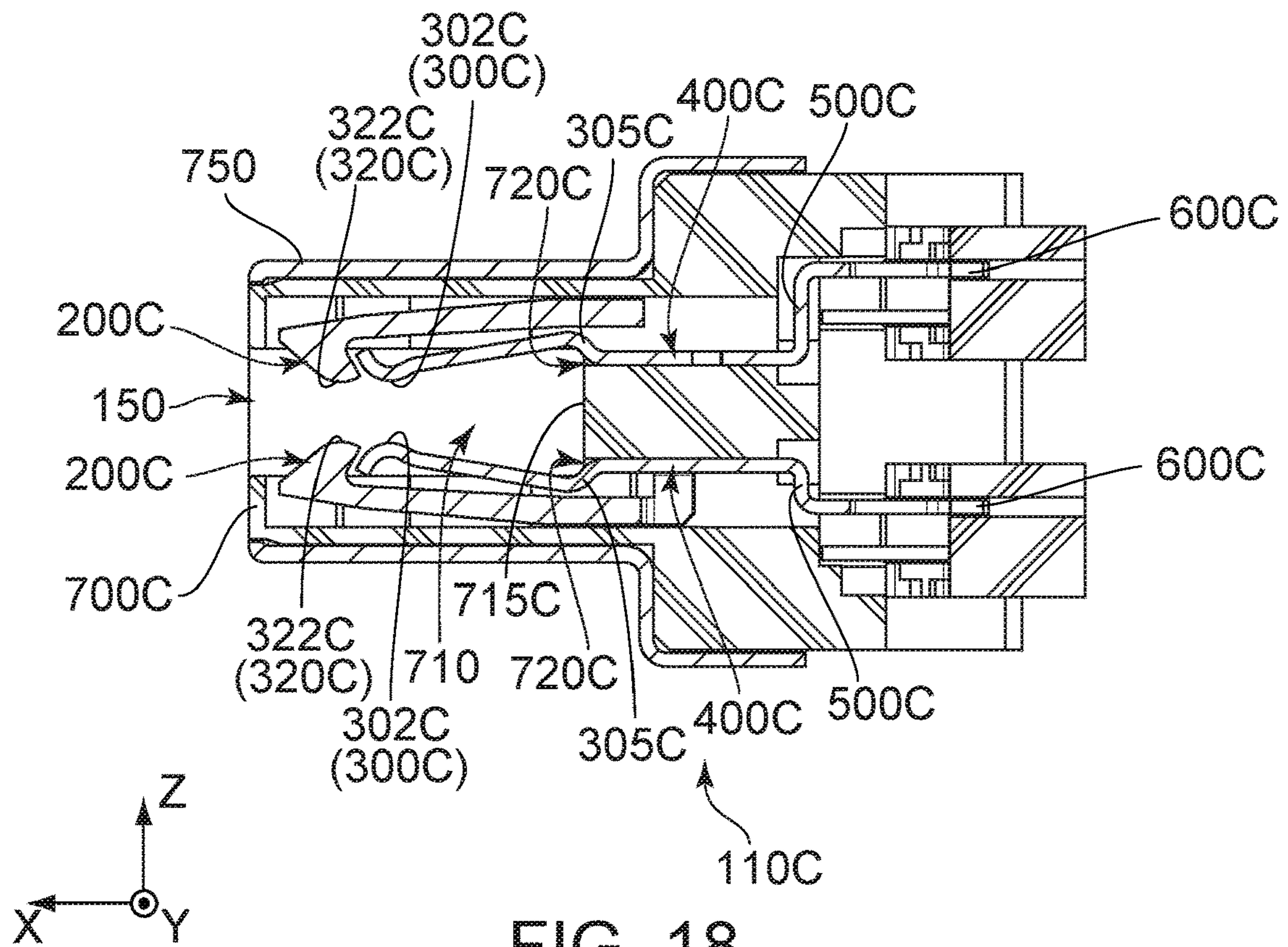


FIG. 18

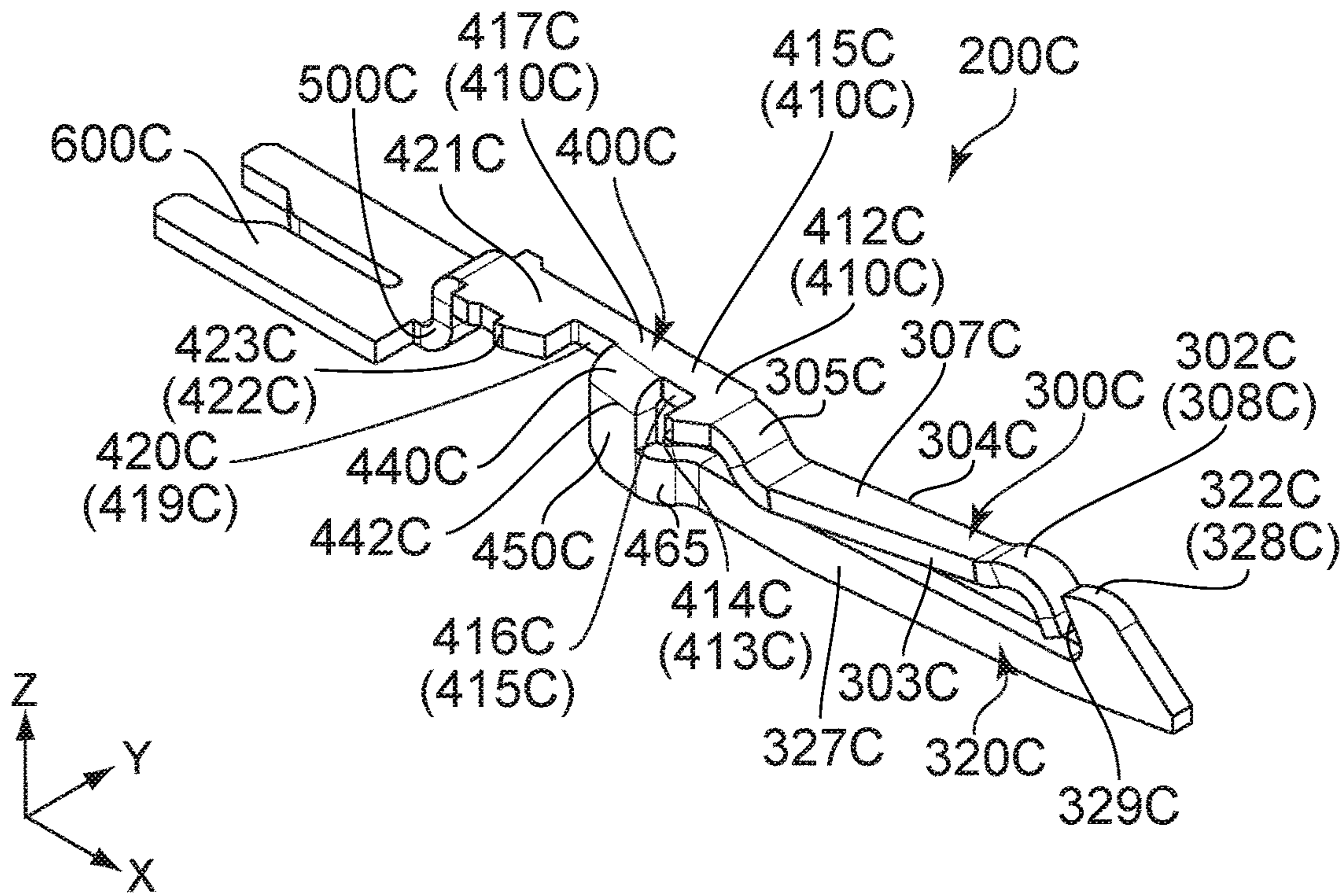


FIG. 19

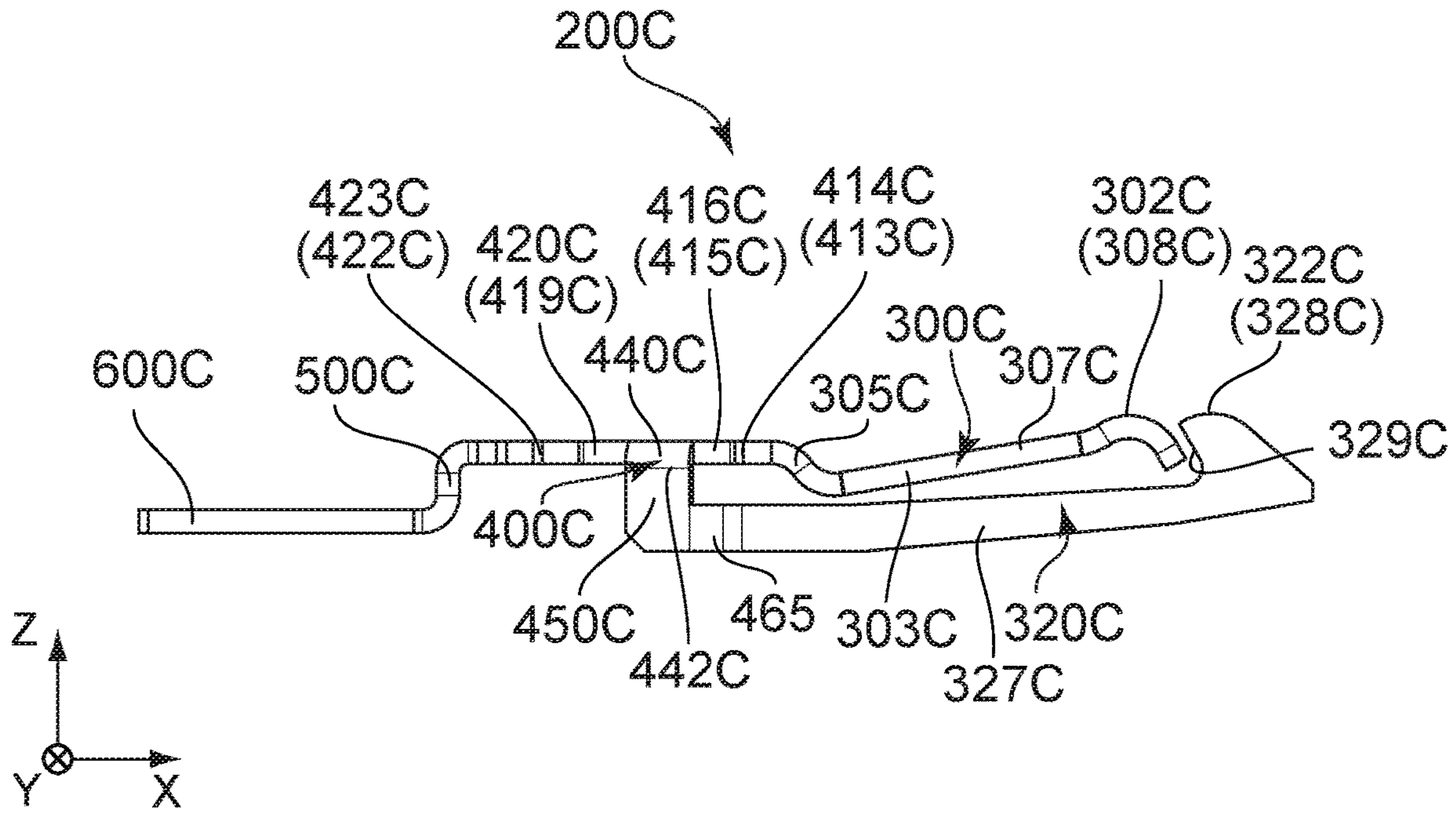


FIG. 20



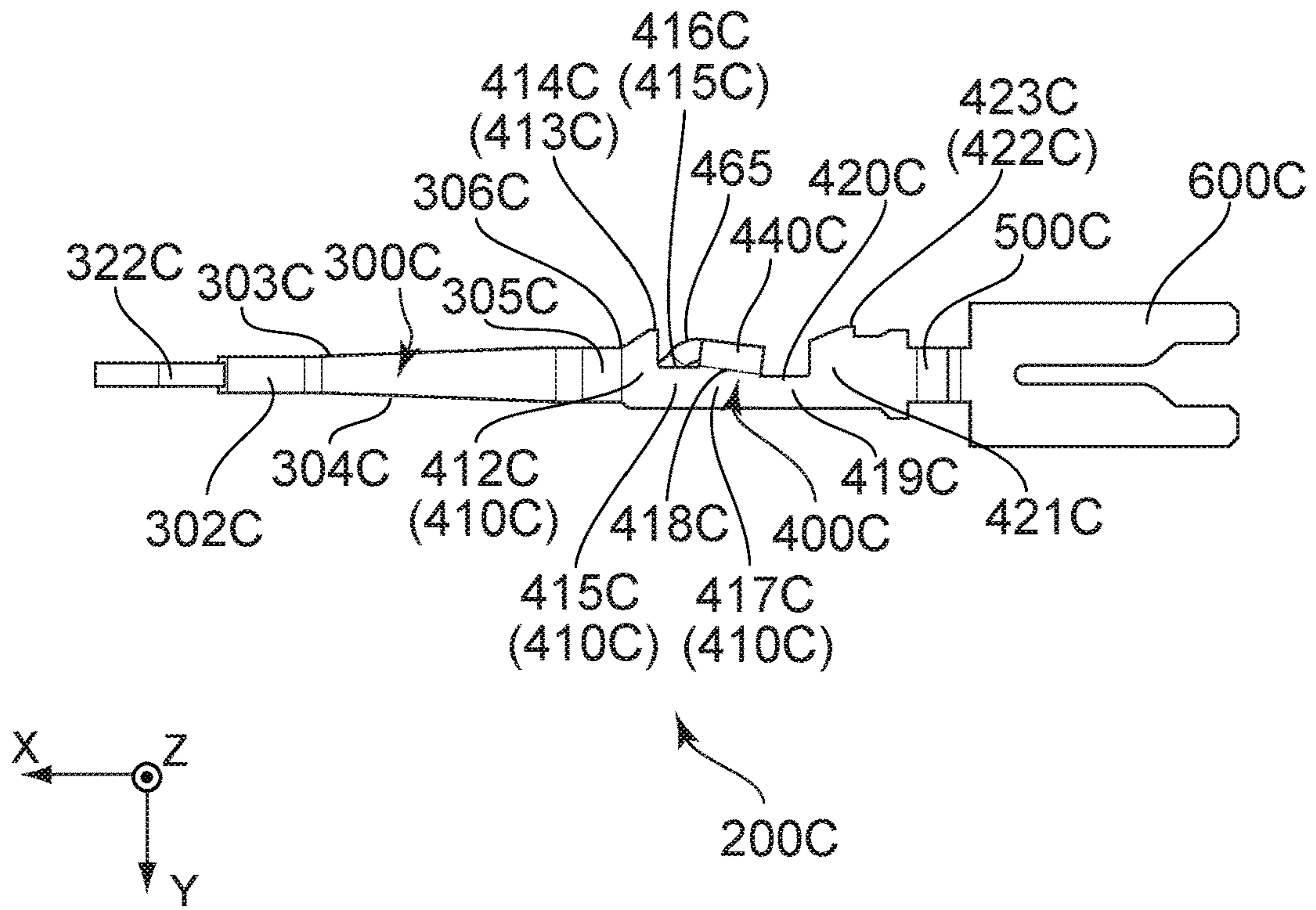


FIG. 21

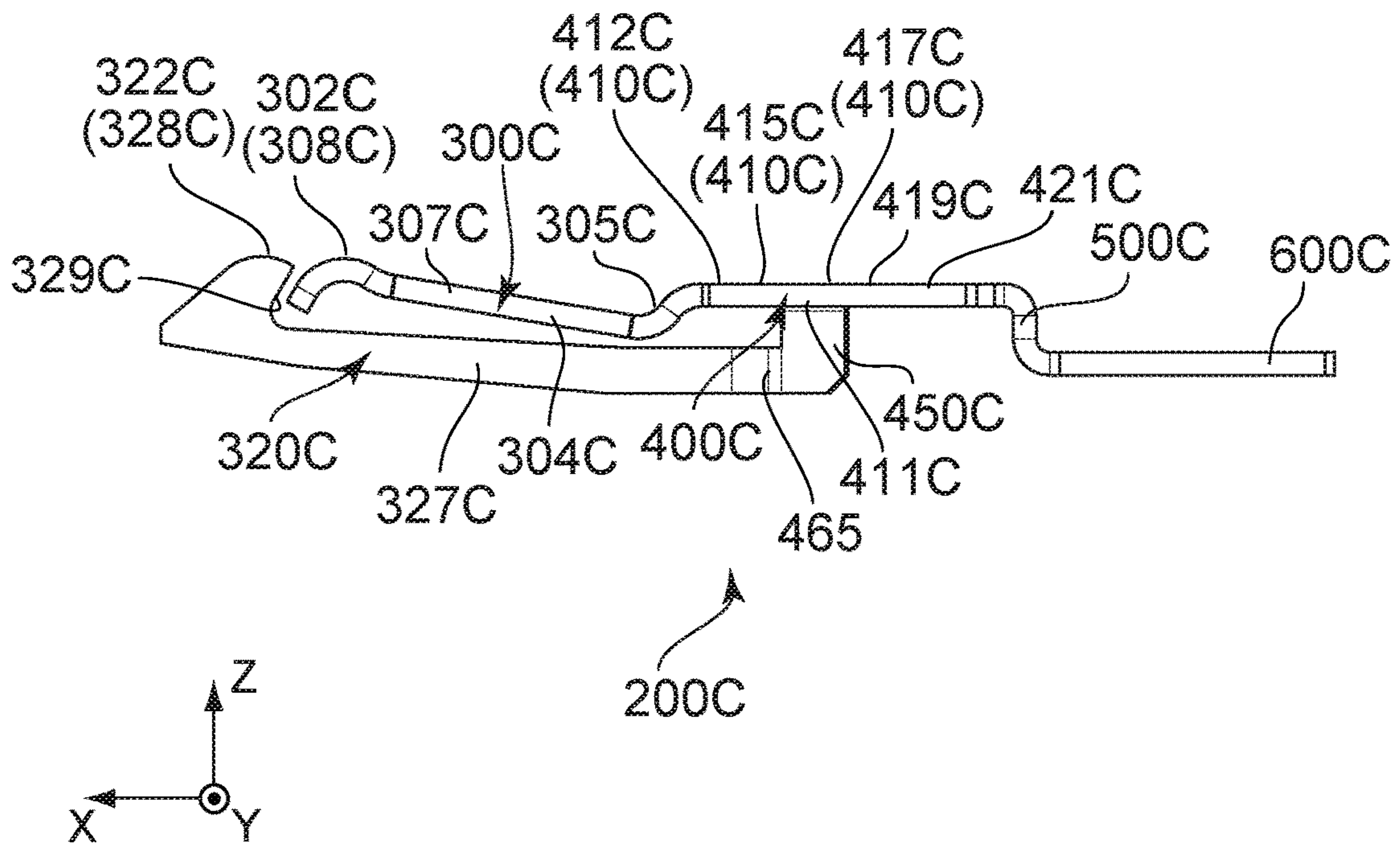


FIG. 22

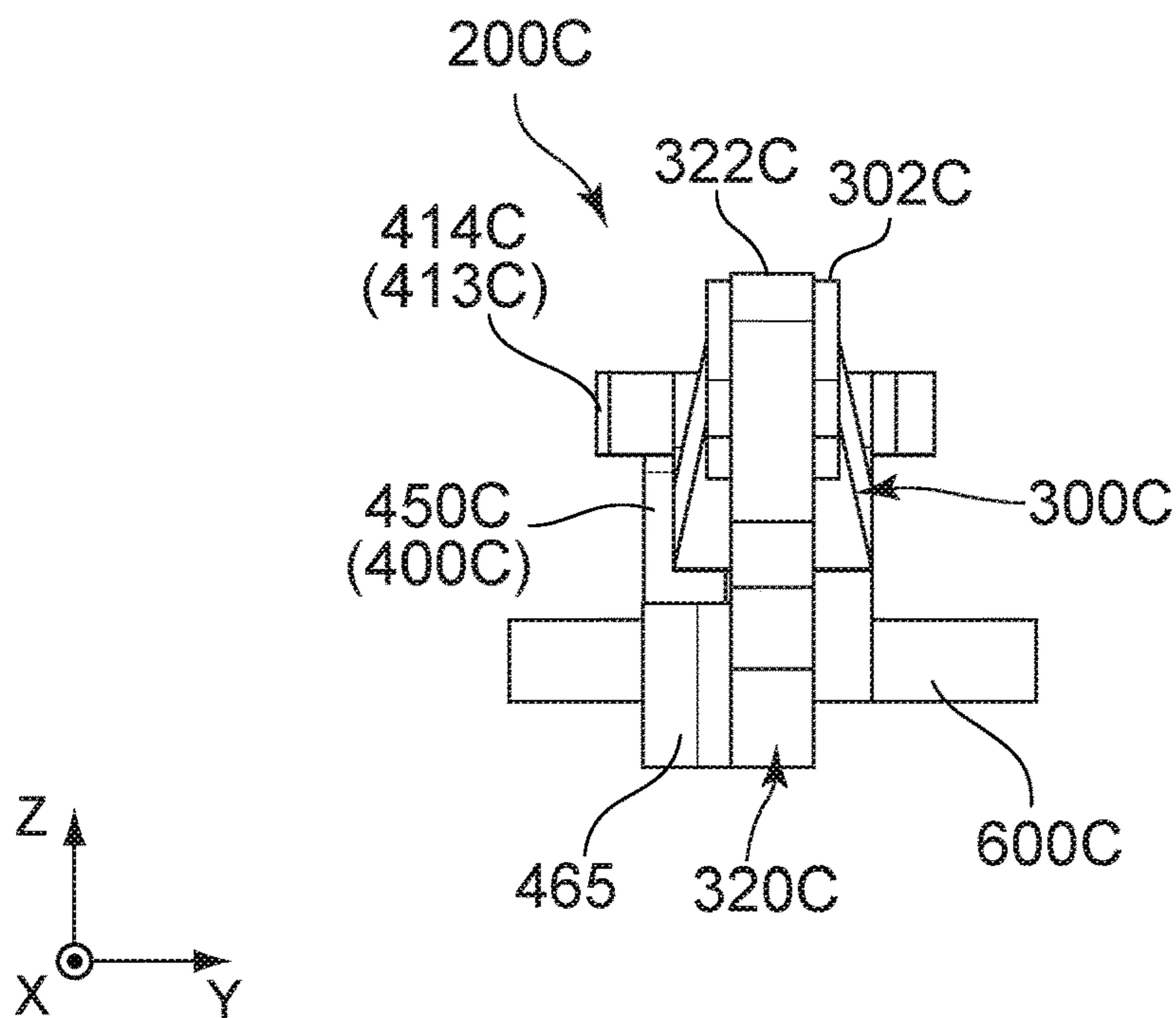


FIG. 23

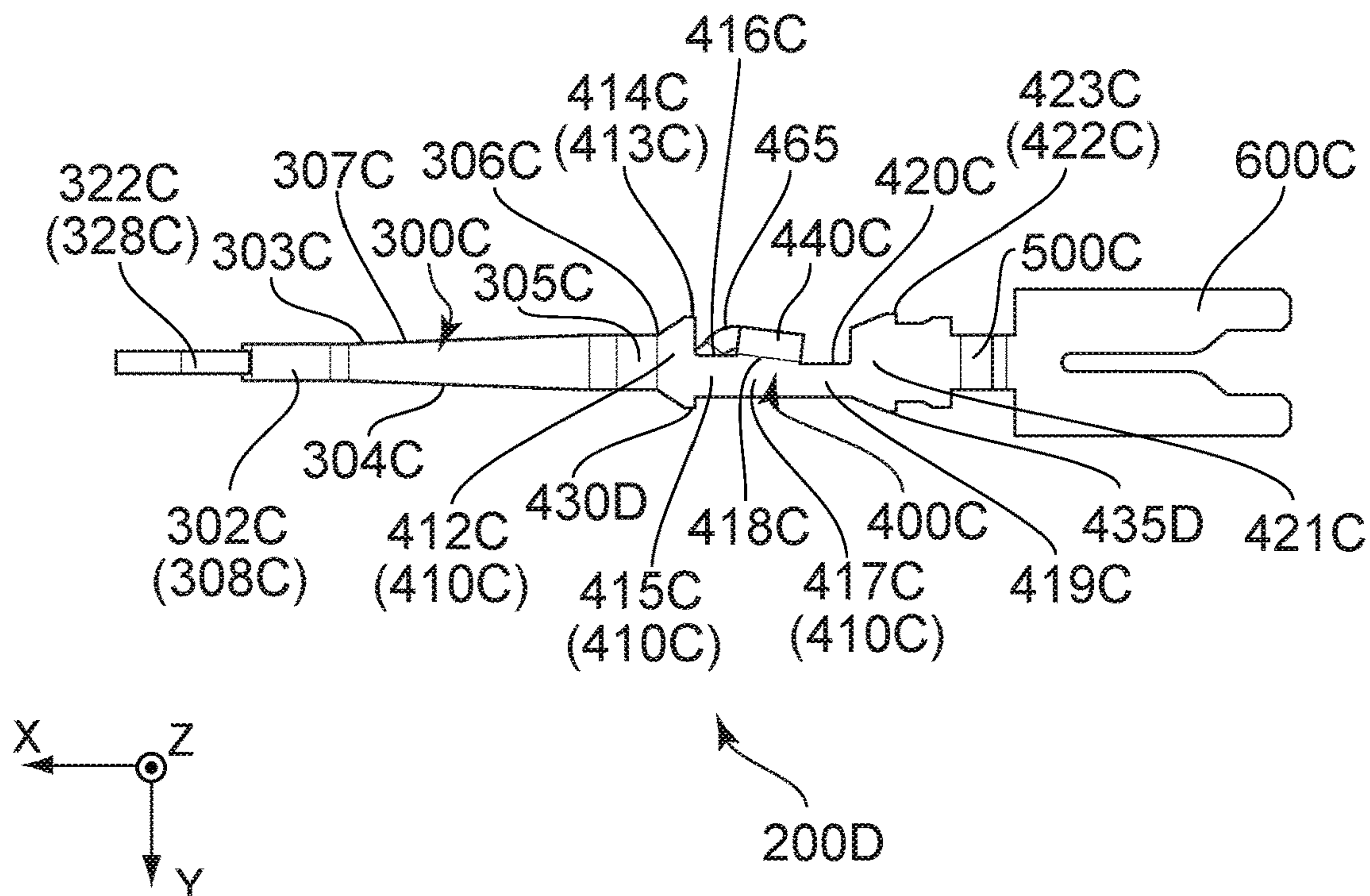


FIG. 24



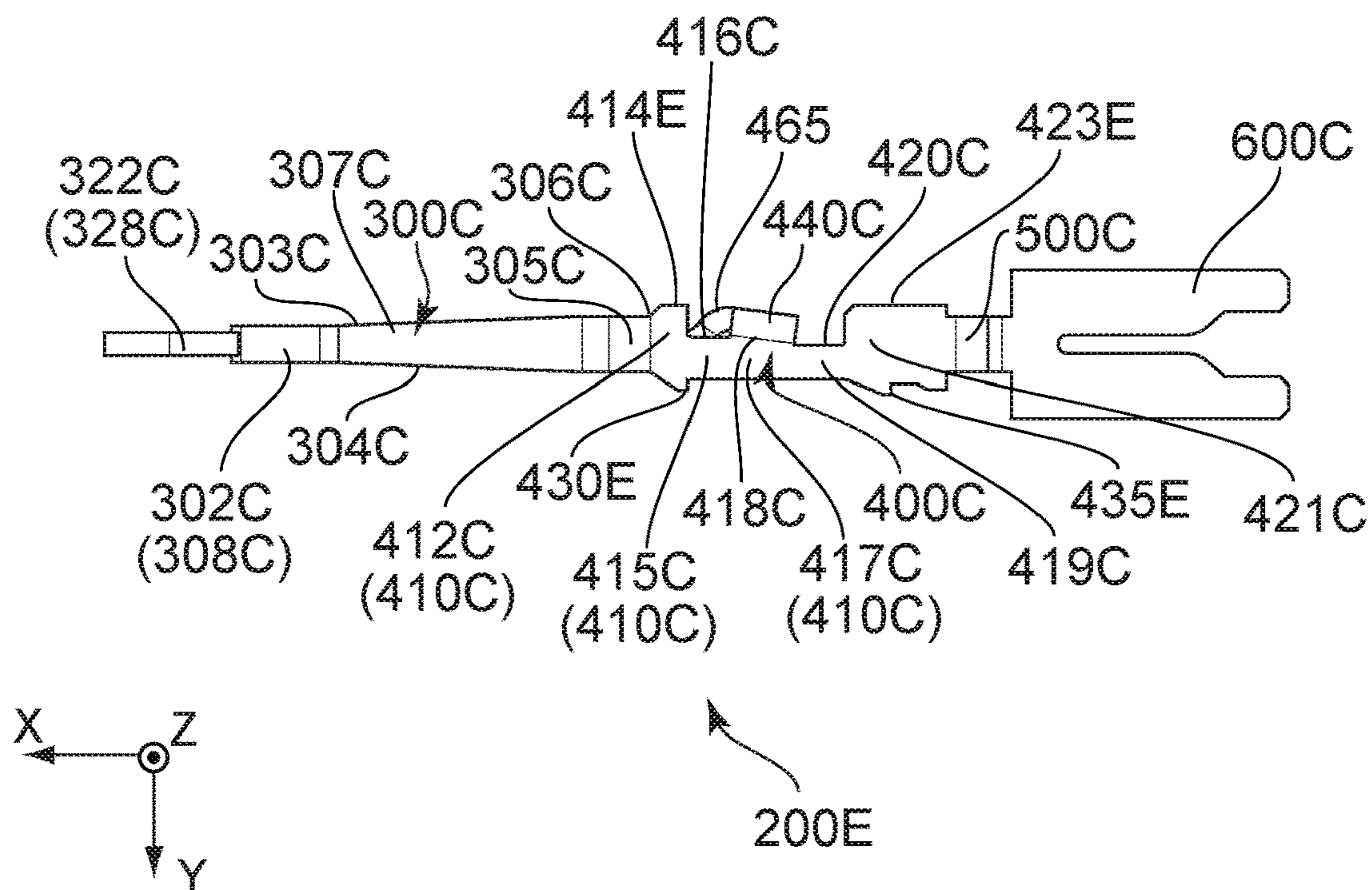


FIG. 25

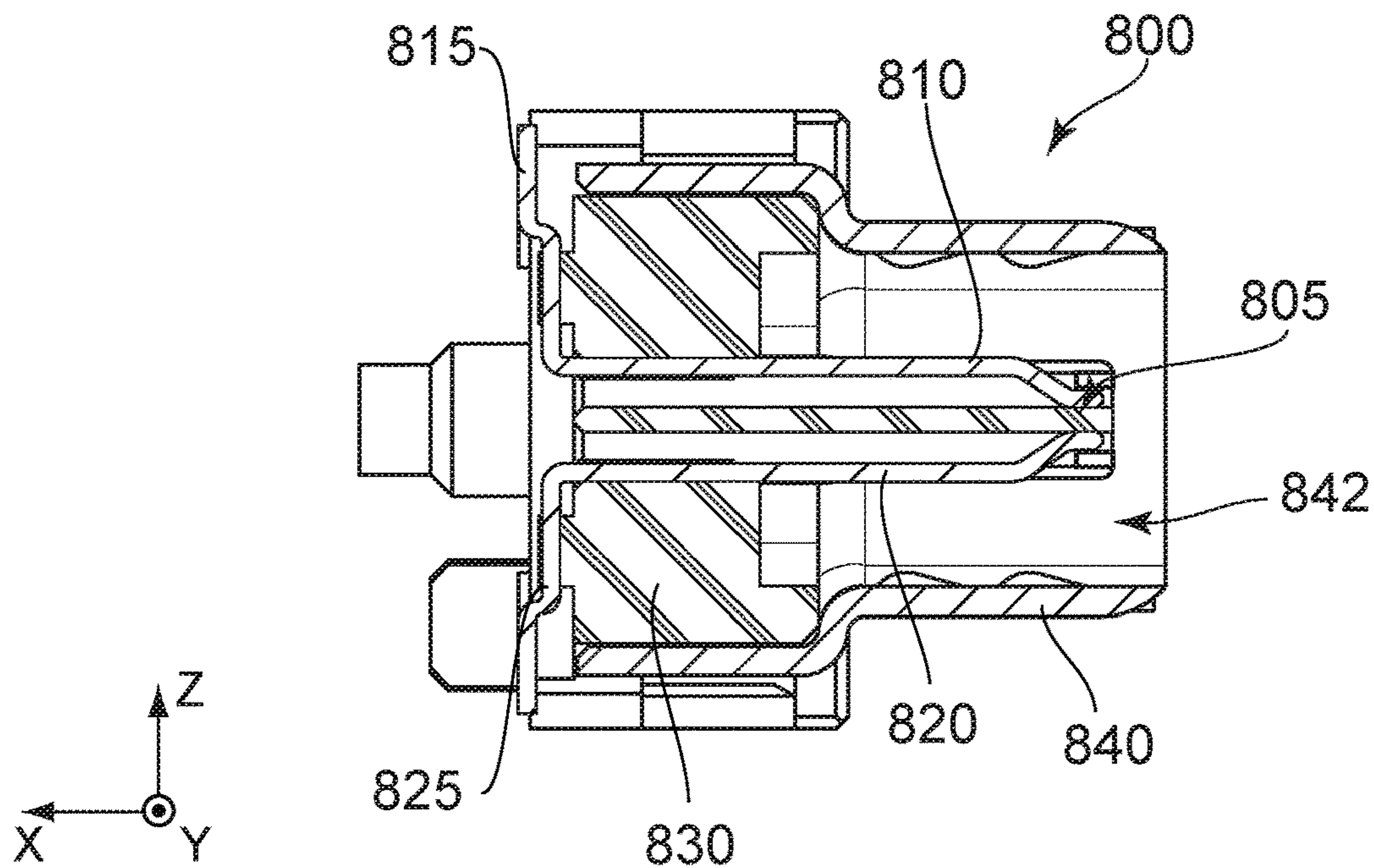


FIG. 26

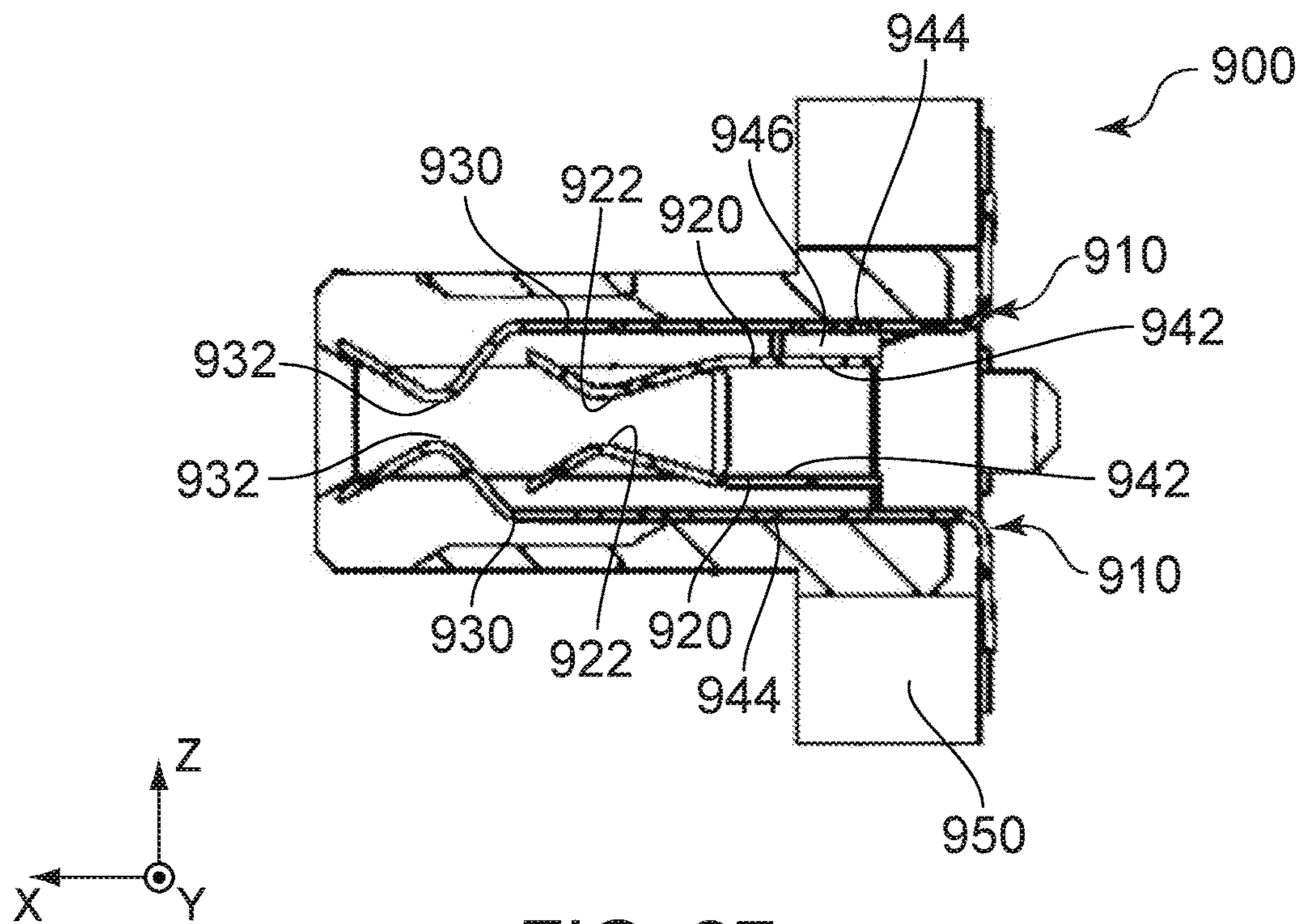


FIG. 27  
PRIOR ART

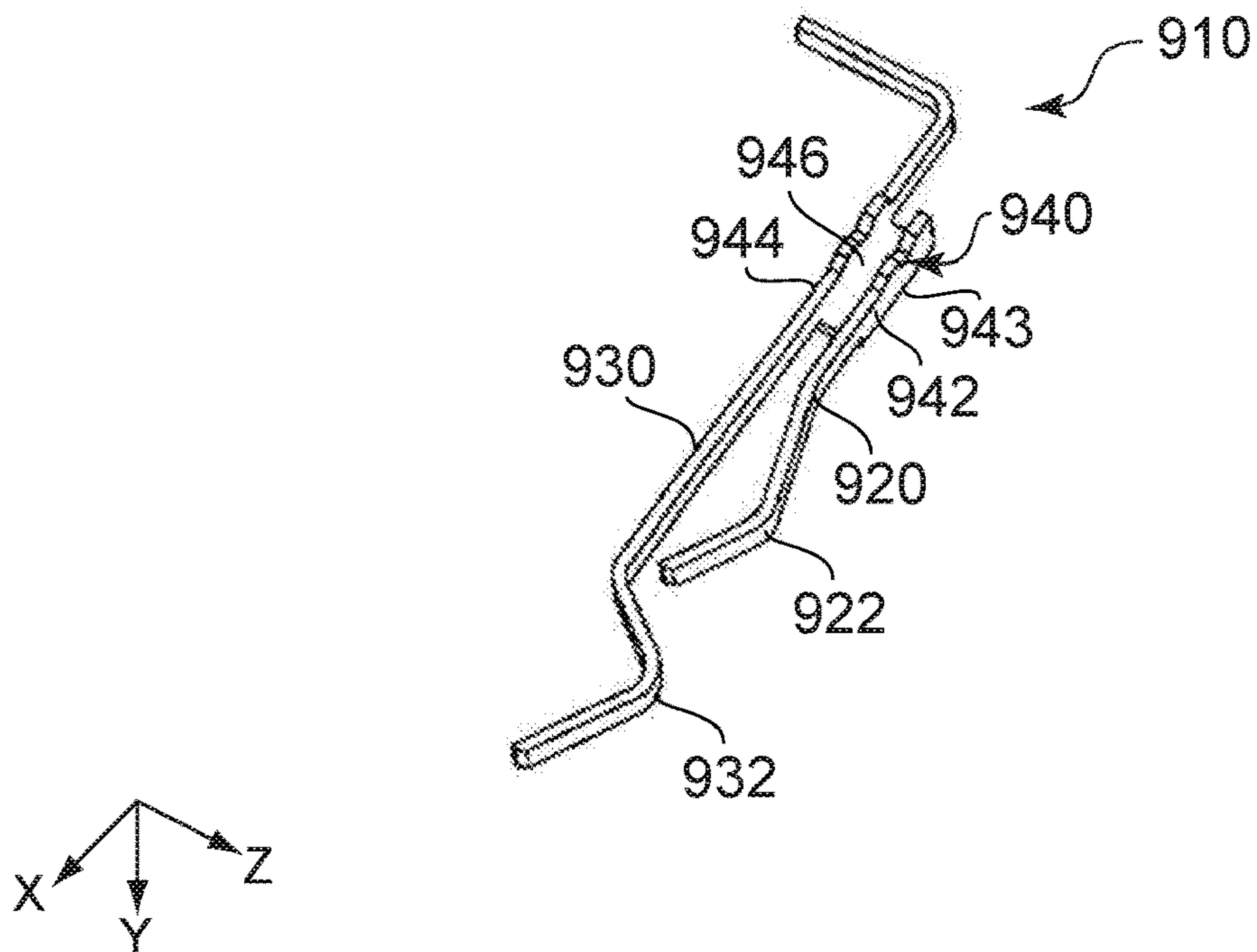


FIG. 28  
PRIOR ART



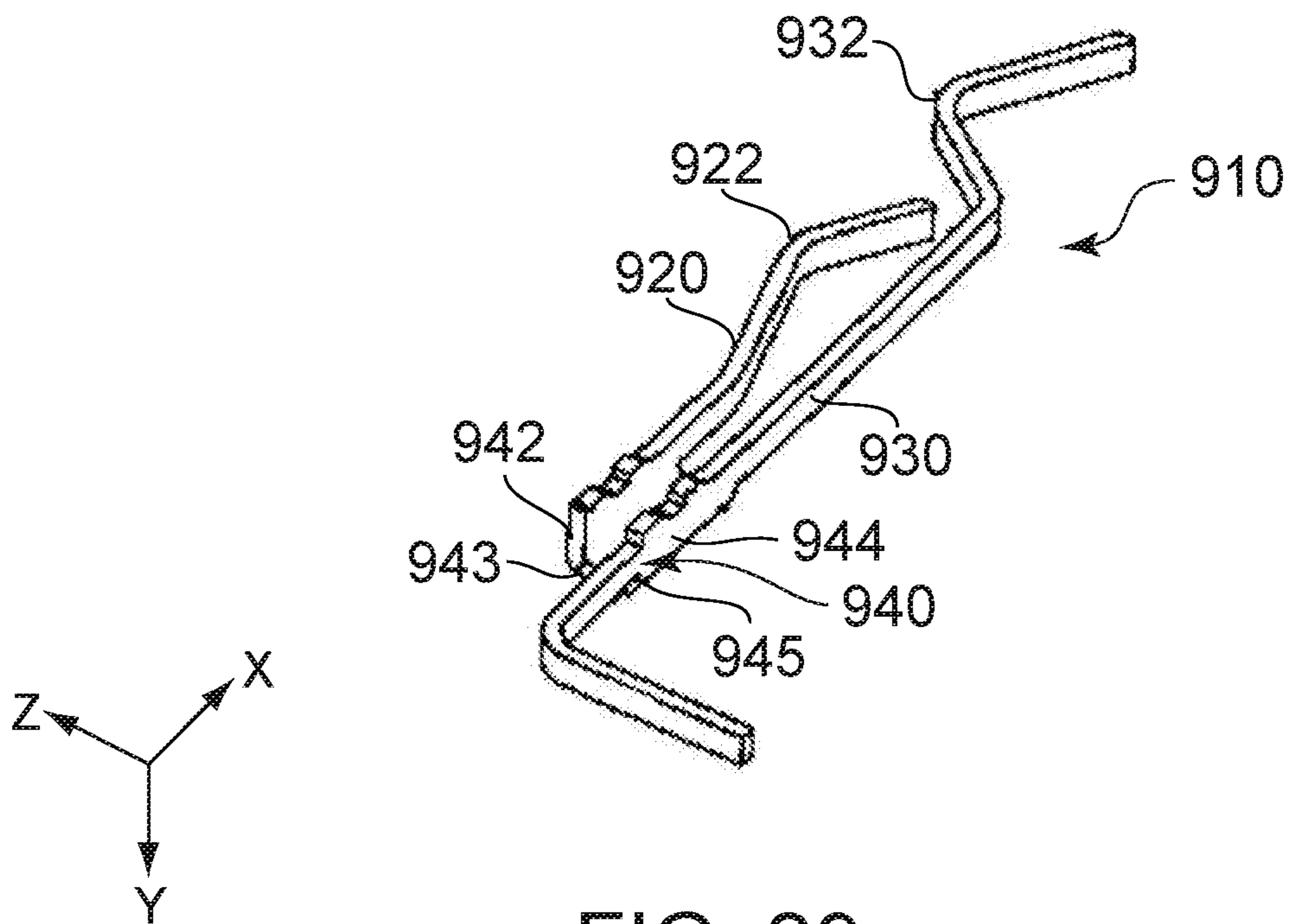


FIG. 29  
PRIOR ART

1

**CONNECTOR MATEABLE WITH A MATING  
CONNECTOR AND INCLUDING A CONTACT  
WITH A NARROW PORTION TO ACHIEVE  
A REDUCED CONTACT WIDTH**

CROSS REFERENCE TO RELATED  
APPLICATIONS

This application is based on and claims priority under 35 U.S.C. § 119 to Japanese Patent Application No. JP2016-197129 filed Oct. 5, 2016, the contents of which are incorporated herein in their entirety by reference.

BACKGROUND OF THE INVENTION

This invention relates to a connector comprising a contact which enables the connector to have a reduced size in a width direction.

As shown in FIG. 27, JP-A 2016-110966 (Patent Document 1) discloses a connector 900 which is mateable with a mating connector (not shown) along a mating direction, or along an X-direction. The connector 900 comprises a plurality of contacts 910 and a holding member 950. Each of the contacts 910 is held by the holding member 950. As shown in FIGS. 28 and 29, each of the contacts 910 comprises a first contact piece 920, a second contact piece 930, a first contact portion 922, a second contact portion 932 and a coupling portion 940. The first contact piece 920 and the second contact piece 930 are arranged in an up-down direction, or in a Z-direction. The first contact portion 922 is provided in the vicinity of a free end of the first contact piece 920. The second contact portion 932 is provided in the vicinity of a free end of the second contact piece 930. The coupling portion 940 has two side walls 942, 944, two bent portions 943, 945 and a wall portion 946. The bent portion 943 extends from an end of the side wall 942 in a width direction, or in a Y-direction, and is bent in the Z-direction. The bent portion 945 extends from an end of the side wall 944 in the width direction and is bent in the Z-direction. The bent portions 943, 945 are coupled with each other by the wall portion 946. The first contact piece 920 extends from the side wall 942 in the mating direction, or in the X-direction. The second contact piece 930 extends from the side wall 944 in the mating direction, or in the X-direction.

A size of the contact 910 of Patent Document 1 in the width direction depends on a size of the coupling portion 940 in the width direction. In addition, a size of each of the first contact piece 920 and the second contact piece 930 in the width direction depends on the size of the coupling portion 940 in the width direction. Accordingly, the connector 900, which comprises the contacts 910, cannot have a reduced size in the width direction while each of the first contact piece 920 and the second contact piece 930 has an increased size in the width direction.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a connector comprising a contact which enables the connector to have a reduced size in a width direction.

One aspect of the present invention provides a connector mateable with a mating connector along a front-rear direction. The connector comprises at least one contact and a holding member. The holding member holds the at least one contact. The at least one contact has a first support portion, a second support portion, a first contact portion, a second contact portion and a coupling portion. Each of the first

2

support portion and the second support portion is resiliently deformable. The first contact portion is supported by the first support portion. The second contact portion is supported by the second support portion. Each of the first contact portion and the second contact portion is movable in an up-down direction perpendicular to the front-rear direction. The first support portion has a first edge and a second edge in a width direction perpendicular to both the front-rear direction and the up-down direction. The first edge faces a first orientation of the width direction. The second edge faces a second orientation of the width direction. The first orientation and the second orientation are opposite to each other in the width direction. The coupling portion couples the first support portion and the second support portion with each other. The coupling portion has an upper main portion and an upper bent portion. The upper main portion has an upper front wide portion, an upper front narrow portion and an upper base portion. The upper front wide portion is fixed to the holding member so as to be immovable in the width direction. The first support portion extends forward from the upper front wide portion in the front-rear direction. The upper front narrow portion is positioned between the upper front wide portion and the upper base portion in the front-rear direction. The upper front narrow portion has an edge facing the first orientation. The at least one contact has a first boundary portion between the first edge of the first support portion and the upper front wide portion in the front-rear direction. The edge of the upper front narrow portion is positioned beyond the first boundary portion in the second orientation. The upper base portion has an edge facing the first orientation. The upper bent portion extends from the edge of the upper base portion and is bent downward.

In the contact of the connector of the present invention, the edge, which faces the first orientation, of the upper front narrow portion is positioned in the second orientation beyond the first boundary portion between the first edge of the first support portion and the upper front wide portion. In addition, the upper bent portion extends from the edge, which faces the first orientation, of the upper base portion and is bent downward. Accordingly, as compared with the contact of Patent Document 1, the contact as a whole can have a reduced size in the width direction while a base of the first support portion has an increased size in the width direction. Thus, the connector can have a reduced size in the width direction.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an upper perspective view showing a connector according to a first embodiment of the present invention.

FIG. 2 is an upper perspective view showing a connector body which is included in the connector of FIG. 1.

FIG. 3 is a front view showing the connector body of FIG. 2.

FIG. 4 is a cross-sectional view showing the connector body of FIG. 3, taken along line A-A.

FIG. 5 is a cross-sectional view showing the connector body of FIG. 3, taken along line B-B.

FIG. 6 is an upper perspective view showing a contact which is included in the connector body of FIG. 3, wherein a part of the contact is illustrated enlarged.

FIG. 7 is a side view showing the contact of FIG. 6.

FIG. 8 is a top view showing the contact of FIG. 6.

FIG. 9 is another side view showing the contact of FIG. 6.

FIG. 10 is a rear view showing the contact of FIG. 6.



FIG. 11 is an upper perspective view showing a modification of the contact of FIG. 6.

FIG. 12 is another upper perspective view showing the contact of FIG. 11.

FIG. 13 is a top view showing another modification of the contact of FIG. 6.

FIG. 14 is an upper perspective view showing the contact of FIG. 13.

FIG. 15 is an upper perspective view showing a connector body which is included in a connector according to a second embodiment of the present invention.

FIG. 16 is a front view showing the connector body of FIG. 15.

FIG. 17 is a cross-sectional view showing the connector body of FIG. 16, taken along line C-C.

FIG. 18 is a cross-sectional view showing the connector body of FIG. 16, taken along line D-D.

FIG. 19 is an upper perspective view showing a contact which is included in the connector body of FIG. 16.

FIG. 20 is a side view showing the contact of FIG. 19.

FIG. 21 is a top view showing the contact of FIG. 19.

FIG. 22 is another side view showing the contact of FIG. 19.

FIG. 23 is a front view showing the contact of FIG. 19.

FIG. 24 is a top view showing a modification of the contact of FIG. 19.

FIG. 25 is a top view showing another modification of the contact of FIG. 19.

FIG. 26 is a cross-sectional view showing a mating connector according to an embodiment of the present invention.

FIG. 27 is a cross-sectional view showing a connector of Patent Document 1.

FIG. 28 is an upper perspective view showing a contact which is included in the connector of FIG. 27.

FIG. 29 is another upper perspective view showing the contact of FIG. 28.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof are shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that the drawings and detailed description thereto are not intended to limit the invention to the particular form disclosed, but on the contrary, the intention is to cover all modifications, equivalents and alternatives falling within the spirit and scope of the present invention as defined by the appended claims.

#### DESCRIPTION OF PREFERRED EMBODIMENTS

##### First Embodiment

As shown in FIGS. 1, 5 and 26, a connector 100 according to a first embodiment of the present invention is mateable with a mating connector 800 along a front-rear direction. In the present embodiment, the front-rear direction is an X-direction. Specifically, it is assumed that forward is a positive X-direction while rearward is a negative X-direction.

As understood from FIG. 26, the mating connector 800 of an embodiment of the present invention has a plurality of mating upper contacts 810, a plurality of mating lower contacts 820, a mating holding member 830 and a mating shell 840. The mating holding member 830 has a plate portion 805. The mating holding member 830 holds the mating upper contacts 810 and the mating lower contacts 820. Each of the mating upper contacts 810 is provided on

an upper surface of the plate portion 805. Each of the mating upper contacts 810 has an upper fixed portion 815 which extends upward from a front end of the mating holding member 830. Each of the mating lower contacts 820 is provided on a lower surface of the plate portion 805. Each of the mating lower contacts 820 has a lower fixed portion 825 which extends downward from the front end of the mating holding member 830. Each of the upper fixed portion 815 and the lower fixed portion 825 is fixed to a circuit board (not shown). In the present embodiment, an up-down direction is a Z-direction. Specifically, upward is a positive Z-direction, and downward is a negative Z-direction. The mating shell 840 partly covers the mating holding member 830 and forms a mating fitting portion 842.

As shown in FIGS. 1 and 2, the connector 100 according to the present embodiment comprises a connector body 110 which is positioned at a front of the connector 100 in the front-rear direction.

As shown in FIGS. 2 to 5, the connector body 110 comprises an opening 150, a holding member 700, a plurality of contacts 200 and a shell 750. The holding member 700 is made of insulator. Each of the contacts 200 is made of conductor. The shell 750 is made of metal. The shell 750 partially covers the holding member 700. A front end of the shell 750 forms a fitting portion 752.

As shown in FIGS. 2 to 5, the opening 150 of the present embodiment is opened at a front of the connector body 110 in the front-rear direction.

As shown in FIGS. 4 and 5, the holding member 700 of the present embodiment has a receiving portion 710 and a plurality of contact holding portions 720. The receiving portion 710 receives the plate portion 805 of the mating connector 800 when the connector 100 and the mating connector 800 are mated with each other. The receiving portion 710 has a rear wall 715 which is positioned rearwardly away from the opening 150 in the front-rear direction. In detail, as understood from FIGS. 2, 5 and 26, when the connector 100 is mated with the mating connector 800, the fitting portion 752 is received in the mating fitting portion 842 while the plate portion 805 is received in the receiving portion 710 through the opening 150. Referring to FIGS. 4 and 5 again, the contact holding portions 720 hold the contacts 200, respectively. Each of the contact holding portions 720 is a hole which pierces the holding member 700 in the front-rear direction. Each of the contact holding portions 720 has two inner walls which face each other in a width direction perpendicular to both the front-rear direction and the up-down direction. In the present embodiment, the width direction is a Y-direction.

As shown in FIGS. 6 to 9, each of the contacts 200 has a first support portion 300, a first contact portion 302, a second support portion 320, a second contact portion 322, a coupling portion 400, an upper rear narrow portion 419, an upper rear wide portion 421, a lower rear narrow portion 479, a lower rear wide portion 481, a connecting portion 500 and a fixed portion 600.

As shown in FIGS. 6 to 9, the first support portion 300 has a slope portion 305, a first plate portion 307 and a bulge portion 308. The slope portion 305 is positioned at a rear end of the first support portion 300 in the front-rear direction. The slope portion 305 slopes forward and downward. The first plate portion 307 has a plate-like shape intersecting with the up-down direction. The first plate portion 307 extends forward from a front end of the slope portion 305. The bulge portion 308 extends forward and upward from a front end of the first plate portion 307 and then extends forward and downward. Specifically, a front end of the bulge portion 308



5

is a free end. More specifically, the bulge portion **308** has a substantially semicircular shape in a plane perpendicular to the width direction. The first contact portion **302** is positioned at an upper end of the bulge portion **308**.

As shown in FIGS. **6** to **9**, the first support portion **300** has a first edge **303** and a second edge **304** in the width direction. Each of the first edge **303** and the second edge **304** is a surface perpendicular to the width direction. The first edge **303** faces a first orientation of the width direction. The second edge **304** faces a second orientation of the width direction. In the present embodiment, the first orientation is a positive Y-direction while the second orientation is a negative Y-direction. In other words, the first orientation and the second orientation are opposite to each other.

As understood from FIGS. **2**, **3**, **5** and **6**, the first support portion **300** is resiliently deformable. The first contact portion **302** is positioned in the vicinity of the free end of the bulge portion **308** of the first support portion **300**. The first contact portion **302** is supported by the first support portion **300**. Accordingly, the first contact portion **302** is movable in the up-down direction. More specifically, the first contact portion **302** of the first support portion **300** of the contact **200** shown in each of FIGS. **6** to **10** faces upward in the up-down direction and is movable downward.

As shown in FIGS. **6** to **9**, the first support portion **300** has a size in the width direction and another size in the up-down direction, and the size of the first support portion **300** in the width direction is greater than the size of the first support portion **300** in the up-down direction. More specifically, the first plate portion **307** of the first support portion **300** has a size in the width direction and another size in the up-down direction, and the size of the first plate portion **307** in the width direction is greater than the size of the first plate portion **307** in the up-down direction.

As shown in FIGS. **6** to **9**, the second support portion **320** has a second plate portion **327** and a folded back portion **328**. The second plate portion **327** has a plate-like shape intersecting with the up-down direction. The folded back portion **328** extends forward and upward from a front end of the second plate portion **327** and is then folded back so as to have a curved shape. An end of the folded back portion **328** is a free end. Specifically, the folded back portion **328** has a substantially U-shape in the plane perpendicular to the width direction. The second contact portion **322** is positioned at an upper end of the folded back portion **328**.

As shown in FIGS. **6** to **9**, the second support portion **320** has a size in the width direction and another size in the up-down direction, and the size of the second support portion **320** in the width direction is greater than the size of the second support portion **320** in the up-down direction. More specifically, the second plate portion **327** of the second support portion **320** has a size in the width direction and another size in the up-down direction, and the size of the second plate portion **327** in the width direction is greater than the size of the second plate portion **327** in the up-down direction. The second plate portion **327** of the second support portion **320** is positioned below the first support portion **300** in the up-down direction.

As understood from FIGS. **2**, **3**, **5** and **6**, the second support portion **320** is resiliently deformable. The second contact portion **322** is positioned in the vicinity of the free end of the folded back portion **328** of the second support portion **320**. The second contact portion **322** is supported by the second support portion **320**. Accordingly, the second contact portion **322** is movable in the up-down direction. More specifically, the second contact portion **322** of the

6

second support portion **320** of the contact **200** shown in each of FIGS. **6** to **10** faces upward in the up-down direction and is movable downward.

As shown in FIGS. **6** to **9**, the free end of the folded back portion **328** of the second support portion **320** is positioned above the free end of the bulge portion **308** of the first support portion **300** in the up-down direction. The free end of the bulge portion **308** of the first support portion **300** is positioned rearward of the folded back portion **328** of the second support portion **320**, so that the free end of the bulge portion **308** of the first support portion **300** is guarded by the folded back portion **328**. Accordingly, the first support portion **300** is prevented from being buckled by unintended force which is applied to the free end of the bulge portion **308** of the first support portion **300** from its front side.

As shown in FIGS. **6** to **9**, the coupling portion **400** couples the first support portion **300** and the second support portion **320** with each other in the up-down direction. The coupling portion **400** has an upper main portion **410**, an upper bent portion **440**, a lower main portion **470**, a lower bent portion **460** and a wall portion **450**.

As shown in FIGS. **6** to **9**, the upper main portion **410** has a plate-like shape perpendicular to the up-down direction. The upper main portion **410** has an edge **411** facing the second orientation, and the edge **411** has a linear shape. The upper main portion **410** has an upper front wide portion **412**, an upper front narrow portion **415** and an upper base portion **417**.

As shown in FIGS. **6** to **9**, a front end of the upper front wide portion **412** forms a front end of the upper main portion **410**. The upper front wide portion **412** has a press-fit protrusion **413** which protrudes in the first orientation of the width direction. As understood from FIGS. **4** and **6**, the upper front wide portion **412** is fixed to the holding member **700** so as to be immovable in the width direction. A specific method of fixing the upper front wide portion **412** to the holding member **700** will be described later. In the upper front wide portion **412**, an end of the press-fit protrusion **413** in the width direction is an end portion **414** facing the first orientation.

As shown in FIGS. **6** to **9**, the first support portion **300** extends forward from the upper front wide portion **412** in the front-rear direction. More specifically, the slope portion **305** of the first support portion **300** extends forward and downward from the front end of the upper front wide portion **412**.

As shown in FIGS. **6** to **9**, the upper front narrow portion **415** is positioned between the upper front wide portion **412** and the upper base portion **417** in the front-rear direction. More specifically, in the front-rear direction, the upper front narrow portion **415** is positioned rearward of the upper front wide portion **412** and forward of the upper base portion **417**. In the width direction, the upper front narrow portion **415** has a size smaller than a size of the upper front wide portion **412**. Since the upper front wide portion **412** is fixed to the holding member **700** as described above, stress, which arises when the first support portion **300** is resiliently deformed in the up-down direction, is concentrated on a first boundary portion **306** between the first edge **303** of the first support portion **300** and the upper front wide portion **412** in the front-rear direction. Accordingly, the stress can be prevented from being concentrated on the upper front narrow portion **415** having a reduced size in the width direction.

As shown in FIGS. **6** and **8**, the upper front narrow portion **415** has an edge **416** facing the first orientation, and the edge **416** is positioned beyond the first boundary portion **306** in the second orientation. Accordingly, the contact **200** as a



whole can have a reduced size in the width direction while a base of the first support portion 300 has an increased size in the width direction.

As shown in FIGS. 6 to 9, the upper base portion 417 is positioned rearward of the upper front narrow portion 415 in the front-rear direction. The upper base portion 417 has a plate-like shape perpendicular to the up-down direction. The upper base portion 417 has an edge 418 facing the first orientation.

As shown in FIGS. 6 and 8, the upper bent portion 440 extends from the edge 418, which faces the first orientation, of the upper base portion 417 of the upper main portion 410, and is bent downward. Specifically, the upper bent portion 440 is bent downward while extending in the first orientation from the edge 418, which faces the first orientation, of the upper base portion 417. The end portion 414, which faces the first orientation, of the upper front wide portion 412, namely, the end of the press-fit protrusion 413 in the width direction, is positioned beyond the upper bent portion 440 in the first orientation. More specifically, the end portion 414 of the press-fit protrusion 413 of the upper front wide portion 412 is positioned in the first orientation beyond an edge 442, which faces the first orientation, of the upper bent portion 440.

As shown in FIGS. 6, 7 and 9, the lower main portion 470 has a lower front wide portion 472, a lower front narrow portion 475 and a lower base portion 477.

As shown in FIGS. 6, 7 and 9, the lower main portion 470 has a plate-like shape perpendicular to the up-down direction. The lower main portion 470 has an edge 471 facing the second orientation, and the edge 471 has a linear shape.

As shown in FIGS. 6, 8 and 9, the lower front wide portion 472 has a press-fit protrusion 473 which protrudes in the first orientation of the width direction. As understood from FIG. 5, the lower front wide portion 472 is fixed to the holding member 700 so as to be immovable in the width direction. A specific method of fixing the lower front wide portion 472 to the holding member 700 will be described later. In the lower front wide portion 472, an end of the press-fit protrusion 473 in the width direction is an end portion 474 facing the first orientation.

As shown in FIG. 7, the second support portion 320 extends forward from the lower front wide portion 472 in the front-rear direction. More specifically, the second plate portion 327 of the second support portion 320 extends forward from a front end of the lower front wide portion 472.

As shown in FIG. 7, the lower front narrow portion 475 is positioned between the lower front wide portion 472 and the lower base portion 477 in the front-rear direction. More specifically, in the front-rear direction, the lower front narrow portion 475 is positioned rearward of the lower front wide portion 472 and forward of the lower base portion 477. In the width direction, the lower front narrow portion 475 has a size smaller than a size of the lower front wide portion 472. As understood from FIGS. 6, 7 and 9, the lower front narrow portion 475 has an edge 476 facing the first orientation, and the edge 476 is positioned in the second orientation beyond a second boundary portion 325 between an edge 324, which faces the first orientation, of the second support portion 320 and the lower front wide portion 472 in the front-rear direction. Accordingly, the contact 200 as a whole can have a reduced size in the width direction while a base of the second support portion 320 has an increased size in the width direction.

As shown in FIG. 7, the lower base portion 477 is positioned rearward of the lower front narrow portion 475 in the front-rear direction. The lower base portion 477 has a

plate-like shape perpendicular to the up-down direction. As shown in FIG. 6, the lower base portion 477 has an edge 478 facing the first orientation.

As understood from FIGS. 6 and 9, the lower bent portion 460 extends from the edge 478, which faces the first orientation, of the lower base portion 477 of the lower main portion 470, and is bent upward. Specifically, the lower bent portion 460 is bent upward while extending in the first orientation from the edge 478, which faces the first orientation, of the lower base portion 477. The end portion 474, which faces the first orientation, of the lower front wide portion 472, namely, the end of the press-fit protrusion 473 in the width direction, is positioned beyond the lower bent portion 460 in the first orientation. More specifically, the end portion 474 of the press-fit protrusion 473 of the lower front wide portion 472 is positioned in the first orientation beyond an edge 462, which faces the first orientation, of the lower bent portion 460.

As shown in FIGS. 6, 7, 9 and 10, the wall portion 450 has a plate-like shape perpendicular to the width direction and couples the upper bent portion 440 and the lower bent portion 460 with each other. More specifically, the wall portion 450 couples a lower end of the upper bent portion 440 and an upper end of the lower bent portion 460 with each other in the up-down direction. Although the wall portion 450 of the present embodiment is perpendicular to the width direction, the present invention is not limited thereto. The wall portion 450 may make an angle other than a right angle with the width direction, provided that the wall portion 450 intersects with the width direction.

As shown in FIGS. 6 to 9, the upper rear narrow portion 419 is positioned between the upper base portion 417 of the upper main portion 410 of the coupling portion 400 and the upper rear wide portion 421 in the front-rear direction. More specifically, in the front-rear direction, the upper rear narrow portion 419 is positioned rearward of the upper base portion 417 and forward of the upper rear wide portion 421. In the width direction, the upper rear narrow portion 419 has a size smaller than a size of the upper rear wide portion 421.

As shown in FIGS. 6 to 9, the upper rear narrow portion 419 has an edge 420 facing the first orientation, and the edge 420 is positioned in the second orientation beyond the first boundary portion 306 between the first edge 303 of the first support portion 300 and the upper front wide portion 412.

As shown in FIGS. 6 and 9, the upper rear wide portion 421 is positioned rearward of the upper rear narrow portion 419 in the front-rear direction. The upper rear wide portion 421 has a press-fit protrusion 422 which protrudes in the first orientation of the width direction. As understood from FIGS. 4 and 6, the upper rear wide portion 421 is fixed to the holding member 700 so as to be immovable in the width direction. A specific method of fixing the upper rear wide portion 421 to the holding member 700 will be described later. In the upper rear wide portion 421, an end of the press-fit protrusion 422 in the width direction is an end portion 423 facing the first orientation. The end portion 423, which faces the first orientation, of the upper rear wide portion 421 is positioned beyond the upper bent portion 440 in the first orientation. More specifically, the end portion 423 of the press-fit protrusion 422 of the upper rear wide portion 421 is positioned in the first orientation beyond the edge 442, which faces the first orientation, of the upper bent portion 440.

As shown in FIGS. 6 to 9, in the contact 200 of the present embodiment, the upper main portion 410 of the coupling portion 400, the upper rear narrow portion 419 and the upper



rear wide portion **421** are positioned in the same plane perpendicular to the up-down direction.

As shown in FIG. 7, the lower rear narrow portion **479** is positioned between the lower base portion **477** of the lower main portion **470** of the coupling portion **400** and the lower rear wide portion **481** in the front-rear direction. More specifically, in the front-rear direction, the lower rear narrow portion **479** is positioned rearward of the lower base portion **477** and forward of the lower rear wide portion **481**. In the width direction, the lower rear narrow portion **479** has a size smaller than a size of the lower rear wide portion **481**. The lower rear narrow portion **479** has an edge **480** facing the first orientation, and the edge **480** is positioned in the second orientation beyond the second boundary portion **325** between the edge **324**, which faces the first orientation, of the second support portion **320** and the lower front wide portion **472**.

As shown in FIG. 7, the lower rear wide portion **481** is positioned rearward of the lower rear narrow portion **479** in the front-rear direction. As shown in FIGS. 6 and 9, the lower rear wide portion **481** has a press-fit protrusion **482** which protrudes in the first orientation of the width direction. As understood from FIG. 5, the lower rear wide portion **481** is fixed to the holding member **700** so as to be immovable in the width direction. A specific method of fixing the lower rear wide portion **481** to the holding member **700** will be described later. In the lower rear wide portion **481**, an end of the press-fit protrusion **482** in the width direction is an end portion **483** facing the first orientation. The end portion **483**, which faces the first orientation, of the lower rear wide portion **481** is positioned beyond the lower bent portion **460** in the first orientation. More specifically, as shown in FIG. 6, the end portion **483** of the press-fit protrusion **482** of the lower rear wide portion **481** is positioned in the first orientation beyond the edge **462**, which faces the first orientation, of the lower bent portion **460**.

As shown in FIG. 7, in the contact **200** of the present embodiment, the lower main portion **470** of the coupling portion **400**, the lower rear narrow portion **479** and the lower rear wide portion **481** are positioned in the same plane perpendicular to the up-down direction.

As shown in FIGS. 6 to 10, the connecting portion **500** extends rearward and downward from a rear end of the lower rear wide portion **481**. A rear end of the connecting portion **500** is connected with a front end of the fixed portion **600**. The fixed portion **600** is connected with a cable (not shown) when used.

As shown in FIGS. 2 to 5, the contacts **200** are held by the holding member **700** so as to be arranged in two rows. The contacts **200** of each row are arranged in the width direction. The two rows are arranged in the up-down direction and include an upper row and a lower row which is positioned below the upper row. The contacts **200** of the upper row correspond to the mating upper contacts **810**, respectively. The contacts **200** of the lower row correspond to the mating lower contacts **820**, respectively. More specifically, each of the contacts **200** of the present embodiment is inserted forward from a rear end of the holding member **700** to be press-fit into the corresponding contact holding portion **720**. As understood from FIG. 5, each of the contacts **200** of the upper row is turned upside down and is press-fit into the corresponding contact holding portion **720**. Meanwhile, each of the press-fit protrusions **413**, **422**, **473** and **482** of the contact **200** bites into one of the inner walls, which face each other in the width direction, of the corresponding contact holding portion **720**. Also meanwhile, the edge **411** of the

upper main portion **410** of the contact **200** is brought into contact with a remaining one of the inner walls, which face each other in the width direction, of the corresponding contact holding portion **720**. Since the edge **411** of the upper main portion **410** has the linear shape as described above, each of the contacts **200** can be properly aligned in the corresponding contact holding portion **720**. Moreover, meanwhile, a bottom surface of the second support portion **320** of the contact **200** is not brought into contact with the holding member **700**.

As understood from FIGS. 2 to 5 and 26, when the connector body **110** of the connector **100** of the present embodiment is mated with the mating connector **800**, the first contact portion **302** of the first support portion **300** and the second contact portion **322** of the second support portion **320** of each of the contacts **200** of the upper row of the connector body **110** are brought into contact with the corresponding mating upper contact **810** of the mating connector **800** while the first contact portion **302** of the first support portion **300** and the second contact portion **322** of the second support portion **320** of each of the contacts **200** of the lower row of the connector body **110** are brought into contact with the corresponding mating lower contact **820** of the mating connector **800**. Meanwhile, the free end of the bulge portion **308** of the first support portion **300** and the free end of the folded back portion **328** of the second support portion **320** are not brought into contact with each other. Specifically, when the connector **100** and the mating connector **800** are mated with each other, both of the first contact portion **302** and the second contact portion **322** of each of the contacts **200** of the upper row are simultaneously brought into contact with the corresponding mating upper contact **810** while both of the first contact portion **302** and the second contact portion **322** of each of the contacts **200** of the lower row are simultaneously brought into contact with the corresponding mating lower contact **820**. Accordingly, when the connector **100** and the mating connector **800** are mated with each other, each of the contacts **200** of the upper row is securely and stably in contact with the corresponding mating upper contact **810** while each of the contacts **200** of the lower row is securely and stably in contact with the corresponding mating lower contact **820**.

The structure of the contact **200** is not limited thereto. For example, the contact **200** can be modified as described below.

Referring to FIGS. 11 to 14, each of contacts **200A** and **200B** according to modifications of the first embodiment has a structure substantially same as that of the contact **200** (see FIG. 8) according to the aforementioned first embodiment. Accordingly, components of the contact **200A**, **200B** shown in FIGS. 11 to 14 which are same as those of the contact **200** of the first embodiment are referred by using reference signs same as those of the contact **200** of the first embodiment.

As shown in FIGS. 11 and 12, dissimilar to the contact **200** of the first embodiment, the contact **200A** according to a modification has press-fit protrusions **413**, **430**, **422**, **435**, **473**, **484**, **482** and **485**. The press-fit protrusions **413** and **430** protrude outward from opposite ends, respectively, of an upper front wide portion **412** in the width direction. The press-fit protrusions **422** and **435** protrude outward from opposite ends, respectively, of an upper rear wide portion **421** in the width direction. The press-fit protrusions **473** and **484** protrude outward from opposite ends, respectively, of a lower front wide portion **472** in the width direction. The press-fit protrusions **482** and **485** protrude outward from opposite ends, respectively, of a lower rear wide portion **481**



## 11

in the width direction. Accordingly, the contact 200A is firmly held by the holding member 700.

As shown in FIGS. 13 and 14, dissimilar to the contact 200 of the first embodiment, the contact 200B of another modification has press-fit protrusions 430, 435, 484 and 485. The press-fit protrusion 430 protrudes from an upper front wide portion 412 in the second orientation. The press-fit protrusion 435 protrudes from an upper rear wide portion 421 in the second orientation. The press-fit protrusion 484 protrudes from a lower front wide portion 472 in the second orientation. The press-fit protrusion 485 protrudes from a lower rear wide portion 481 in the second orientation. Since the upper front wide portion 412 is firmly fixed to the holding member 700 also in the present modification, stress, which arises when a first support portion 300 is resiliently deformed in the up-down direction, is concentrated on a boundary portion between a second edge 304 of the first support portion 300 and the upper front wide portion 412. Accordingly, the stress can be prevented from being concentrated on an upper front narrow portion 415 having a reduced size in the width direction. In the present modification, an end portion 414B, which faces the first orientation, of the upper front wide portion 412 is positioned beyond an upper bent portion 440 in the first orientation, and an end portion 423B, which faces the first orientation, of the upper rear wide portion 421 is positioned beyond the upper bent portion 440 in the first orientation. Similarly, each of an end portion (not shown), which faces the first orientation, of the lower front wide portion 472 and an end portion (not shown), which faces the first orientation, of the lower rear wide portion 481 is positioned beyond a lower bent portion 460 in the first orientation.

## Second Embodiment

Referring to FIGS. 1, 2 and 15, a connector (not shown) according to a second embodiment of the present invention comprises a connector body 110C instead of the connector body 110 (see FIG. 2) in the connector 100 (see FIG. 1) of the first embodiment. The connector body 110C according to the present embodiment has a structure substantially same as that of the connector body 110 (see FIG. 2) according to the aforementioned first embodiment. Accordingly, components of the connector body 110C shown in FIGS. 15 to 18 which are same as those of the connector body 110 of the first embodiment are referred by using reference signs same as those of the connector body 110 of the first embodiment. As for directions in the present embodiment, expressions same as those of the first embodiment will be used hereinbelow.

As shown in FIGS. 15 to 18, the connector body 110C has an opening 150, a holding member 700C, a plurality of contacts 200C and a shell 750.

As shown in FIGS. 15 to 18, the holding member 700C of the present embodiment has a receiving portion 710 and a plurality of contact holding portions 720C. The receiving portion 710 receives the plate portion 805 of the mating connector 800 when the connector (not shown) of the present embodiment and the mating connector 800 are mated with each other. The receiving portion 710 has a rear wall 715C which is positioned rearwardly away from the opening 150 in the front-rear direction. The contact holding portions 720C hold the contacts 200C, respectively. Each of the contact holding portions 720C is a hole which pierces the holding member 700C in the front-rear direction. Each of the contact holding portions 720C has two inner walls which face each other in the width direction.

## 12

As shown in FIGS. 19 to 23, each of the contacts 200C has a first support portion 300C, a second support portion 320C, a first contact portion 302C, a second contact portion 322C, a coupling portion 400C, an upper rear wide portion 421C, an upper rear narrow portion 419C, a connecting portion 500C and a fixed portion 600C.

As shown in FIGS. 19 to 23, the first support portion 300C has a slope portion 305C, a first plate portion 307C and a bulge portion 308C. The slope portion 305C is positioned at a rear end of the first support portion 300C in the front-rear direction. The slope portion 305C slopes forward and downward. The first plate portion 307C has a plate-like shape intersecting with the up-down direction. The first plate portion 307C extends forward and upward from a front end of the slope portion 305C. The bulge portion 308C extends forward and upward from a front end of the first plate portion 307C and then extends forward and downward. Specifically, a front end of the bulge portion 308C is a free end. More specifically, the bulge portion 308C has a substantially semicircular shape in a plane perpendicular to the width direction. The first contact portion 302C is positioned at an upper end of the bulge portion 308C.

As shown in FIGS. 19 to 22, the first support portion 300C has a first edge 303C and a second edge 304C in the width direction. The first edge 303C faces a first orientation of the width direction, and the second edge 304C faces a second orientation of the width direction. In the present embodiment, the first orientation is the negative Y-direction, and the second orientation is the positive Y-direction. In other words, the first orientation and the second orientation are opposite to each other.

As understood from FIGS. 16, 18 and 19, the first support portion 300C is resiliently deformable. The first contact portion 302C is positioned in the vicinity of the free end of the bulge portion 308C of the first support portion 300C. The first contact portion 302C is supported by the first support portion 300C. Accordingly, the first contact portion 302C is movable in the up-down direction perpendicular to the front-rear direction. More specifically, the first contact portion 302C of the first support portion 300C of the contact 200C shown in each of FIGS. 19 to 23 faces upward in the up-down direction and is movable downward.

As shown in FIGS. 19 to 23, the first support portion 300C has a size in the width direction and another size in the up-down direction, and the size of the first support portion 300C in the width direction is greater than the size of the first support portion 300C in the up-down direction. More specifically, the first plate portion 307C of the first support portion 300C has a size in the width direction and another size in the up-down direction, and the size of the first plate portion 307C in the width direction is greater than the size of the first plate portion 307C in the up-down direction.

As shown in FIGS. 19, 20 and 22, the second support portion 320C has a second plate portion 327C and a folded back portion 328C. The second plate portion 327C has a plate-like shape perpendicular to the width direction. The folded back portion 328C extends rearward and upward from a front end of the second plate portion 327C. The folded back portion 328C has a rear edge 329C intersecting with both the front-rear direction and the up-down direction. Specifically, the second support portion 320C has a half arrow shape when viewed in the width direction. The second contact portion 322C is positioned at an upper end of the folded back portion 328C.

As shown in FIGS. 19 to 23, the second support portion 320C has a size in the width direction and another size in the up-down direction, and the size of the second support



portion **320C** in the width direction is smaller than the size of the second support portion **320C** in the up-down direction. More specifically, the second plate portion **327C** of the second support portion **320C** has a size in the width direction and another size in the up-down direction, and the size of the second plate portion **327C** in the width direction is smaller than the size of the second plate portion **327C** in the up-down direction. The second plate portion **327C** of the second support portion **320C** is positioned below the first support portion **300C** in the up-down direction.

As understood from FIGS. **16**, **18** and **19**, the second support portion **320C** is resiliently deformable. In addition, the second contact portion **322C** is supported by the second support portion **320C**. Accordingly, the second contact portion **322C** is movable in the up-down direction. More specifically, in FIGS. **19** to **23**, the illustrated second contact portion **322C** of the second support portion **320C** of the contact **200C** faces upward in the up-down direction and is movable downward.

As shown in FIGS. **19** to **22**, an upper end of the rear edge **329C** of the folded back portion **328C** of the second support portion **320C** is positioned above the free end of the bulge portion **308C** of the first support portion **300** in the up-down direction. The free end of the bulge portion **308C** of the first support portion **300C** is positioned rearward of the rear edge **329C** of the folded back portion **328C** of the second support portion **320C**, so that the free end of the bulge portion **308C** of the first support portion **300C** is guarded by the rear edge **329C**. Accordingly, the first support portion **300C** is prevented from being buckled by unintended force which is applied to the free end of the bulge portion **308C** of the first support portion **300C** from its front side.

As shown in FIGS. **19**, **20** and **22**, the coupling portion **400C** couples the first support portion **300C** and the second support portion **320C** with each other in the up-down direction. The coupling portion **400C** has an upper main portion **410C**, an upper bent portion **440C**, a wall portion **450C** and a curved portion **465**.

As shown in FIGS. **19** to **22**, the upper main portion **410C** has an upper front wide portion **412C**, an upper front narrow portion **415C** and an upper base portion **417C**.

As shown in FIGS. **19** to **22**, the upper main portion **410C** has a plate-like shape. The upper main portion **410C** has an edge **411C** facing the second orientation, and the edge **411C** has a linear shape.

As shown in FIGS. **19** to **21**, the upper front wide portion **412C** has a press-fit protrusion **413C** which protrudes in the first orientation of the width direction. As shown in FIG. **17**, the upper front wide portion **412C** is fixed to the holding member **700C** so as to be immovable in the width direction. A specific method of fixing the upper front wide portion **412C** to the holding member **700C** will be described later. In the upper front wide portion **412C**, an end of the press-fit protrusion **413C** in the width direction is an end portion **414C** facing the first orientation.

As shown in FIGS. **19** to **22**, the first support portion **300C** extends forward from the upper front wide portion **412C** in the front-rear direction. More specifically, the slope portion **305C** of the first support portion **300C** extends forward and downward from a front end of the upper front wide portion **412C**.

As shown in FIGS. **19** to **22**, the upper front narrow portion **415C** is positioned between the upper front wide portion **412C** and the upper base portion **417C** in the front-rear direction. More specifically, in the front-rear direction, the upper front narrow portion **415C** is positioned rearward of the upper front wide portion **412C** and forward

of the upper base portion **417C**. In the width direction, the upper front narrow portion **415C** has a size smaller than a size of the upper front wide portion **412C**. Since the upper front wide portion **412C** is fixed to the holding member **700C** as described above, stress, which arises when the first support portion **300C** is resiliently deformed in the up-down direction, is concentrated on a first boundary portion **306C** between the first edge **303C** of the first support portion **300C** and the upper front wide portion **412C** in the front-rear direction. Accordingly, the stress can be prevented from being concentrated on the upper front narrow portion **415C** having a reduced size in the width direction.

As shown in FIG. **21**, the upper front narrow portion **415C** has an edge **416C** facing the first orientation, and the edge **416C** is positioned beyond the first boundary portion **306C** in the second orientation. Accordingly, the contact **200C** as a whole can have a reduced size in the width direction while a base of the first support portion **300C** has an increased size in the width direction.

As shown in FIGS. **19** to **22**, the upper base portion **417C** is positioned rearward of the upper front narrow portion **415C** in the front-rear direction. The upper base portion **417C** has a plate-like shape perpendicular to the up-down direction. The upper base portion **417C** has an edge **418C** facing the first orientation. The edge **418C** of the present embodiment intersects with both the front-rear direction and the width direction.

As shown in FIGS. **19** to **21**, the upper bent portion **440C** extends from the edge **418C**, which faces the first orientation, of the upper base portion **417C**, and is bent downward. Specifically, the upper bent portion **440C** is bent downward while extending in the first orientation and rearward from the edge **418C**, which faces the first orientation, of the upper base portion **417C**. The end portion **414C**, which faces the first orientation, of the upper front wide portion **412C**, namely, the end of the press-fit protrusion **413C** in the width direction, is positioned beyond the upper bent portion **440C** in the first orientation. More specifically, the end portion **414C** of the press-fit protrusion **413C** of the upper front wide portion **412C** is positioned in the first orientation beyond an edge **442C**, which faces the first orientation, of the upper bent portion **440C**.

As shown in FIGS. **19** and **20**, the wall portion **450C** has a plate-like shape intersecting with both the front-rear direction and the width direction, and extends downward from a lower end of the upper bent portion **440C**.

As shown in FIGS. **19** to **22**, the curved portion **465** extends forward and in the second orientation from a lower part of a front end of the wall portion **450C**. The second support portion **320C** extends forward from a front end of the curved portion **465**.

As shown in FIGS. **19** to **22**, the upper rear narrow portion **419C** is positioned between the upper base portion **417C** of the upper main portion **410C** of the coupling portion **400C** and the upper rear wide portion **421C** in the front-rear direction. More specifically, in the front-rear direction, the upper rear narrow portion **419C** is positioned rearward of the upper base portion **417C** and forward of the upper rear wide portion **421C**. In the width direction, the upper rear narrow portion **419C** has a size smaller than a size of the upper rear wide portion **421C**.

As shown in FIG. **21**, the upper rear narrow portion **419C** has an edge **420C** facing the first orientation, and the edge **420C** is positioned in the second orientation beyond the first boundary portion **306C** between the first edge **303C** of the first support portion **300C** and the upper front wide portion **412C**.



## 15

As shown in FIGS. 19 to 22, the upper rear wide portion 421C is positioned rearward of the upper rear narrow portion 419C in the front-rear direction. The upper rear wide portion 421C has a press-fit protrusion 422C which protrudes in the first orientation of the width direction. As shown in FIG. 17, the upper rear wide portion 421C is fixed to the holding member 700C so as to be immovable in the width direction. A specific method of fixing the upper rear wide portion 421C to the holding member 700C will be described later. In the upper rear wide portion 421C, an end of the press-fit protrusion 422C in the width direction is an end portion 423C facing the first orientation. The end portion 423C, which faces the first orientation, of the upper rear wide portion 421C is positioned beyond the upper bent portion 440C in the first orientation. More specifically, the end portion 423C of the press-fit protrusion 422C of the upper rear wide portion 421C is positioned in the first orientation beyond the edge 442C, which faces the first orientation, of the upper bent portion 440C.

As shown in FIGS. 19 to 22, in the contact 200C of the present embodiment, the upper main portion 410C of the coupling portion 400C, the upper rear narrow portion 419C and the upper rear wide portion 421C are positioned in the same plane perpendicular to the up-down direction.

As shown in FIGS. 19 to 22, the connecting portion 500C extends rearward and downward from a rear end of the upper rear wide portion 421C. A rear end of the connecting portion 500C is connected with a front end of the fixed portion 600C. The fixed portion 600C is connected with a cable (not shown) when used.

As shown in FIGS. 16 to 18, the contacts 200C are held by the holding member 700C so as to be arranged in two rows. The contacts 200C of each row are arranged in the width direction. The two rows are arranged in the up-down direction and include an upper row and a lower row which is positioned below the upper row. The contacts 200C of the upper row correspond to the mating upper contacts 810, respectively. The contacts 200C of the lower row correspond to the mating lower contacts 820, respectively. More specifically, each of the contacts 200C of the present embodiment is inserted forward from a rear end of the holding member 700C to be press-fit into the corresponding contact holding portion 720C. As understood from FIG. 18, each of the contacts 200C of the upper row is turned upside down and is press-fit into the corresponding contact holding portion 720C. Meanwhile, each of the press-fit protrusions 413C and 422C of the contact 200C bites into one of the inner walls, which face each other in the width direction, of the corresponding contact holding portion 720C. Also meanwhile, the edge 411C of the upper main portion 410C of the contact 200C is brought into contact with a remaining one of the inner walls, which face each other in the width direction, of the corresponding contact holding portion 720C. Since the edge 411C of the upper main portion 410C has the linear shape as described above, each of the contacts 200C can be properly aligned in the corresponding contact holding portion 720C.

As shown in FIGS. 15 to 18 and 26, when the connector body 110C of the connector 100C of the present embodiment is mated with the mating connector 800, the first contact portion 302C of the first support portion 300C and the second contact portion 322C of the second support portion 320C of each of the contacts 200C of the upper row of the connector body 110C are brought into contact with the corresponding mating upper contact 810 of the mating connector 800 while the first contact portion 302C of the first support portion 300C and the second contact portion 322C

## 16

of the second support portion 320C of each of the contacts 200C of the lower row of the connector body 110C are brought into contact with the corresponding mating lower contact 820 of the mating connector 800. Meanwhile, the free end of the bulge portion 308C of the first support portion 300C and the rear edge 329C of the folded back portion 328C of the second support portion 320C are not brought into contact with each other. Specifically, when the connector 100C and the mating connector 800 are mated with each other, both of the first contact portion 302C and the second contact portion 322C of each of the contacts 200C of the upper row are simultaneously brought into contact with the corresponding mating upper contact 810 while both of the first contact portion 302C and the second contact portion 322C of each of the contacts 200C of the lower row are simultaneously brought into contact with the corresponding mating lower contact 820. Accordingly, when the connector 100C and the mating connector 800 are mated with each other, each of the contacts 200C of the upper row is securely and stably in contact with the corresponding mating upper contact 810 while each of the contacts 200C of the lower row is securely and stably in contact with the corresponding mating lower contact 820.

The structure of the contact 200C is not limited thereto. For example, the contact 200C can be modified as described below.

Referring to FIGS. 24 and 25, each of contacts 200D and 200E according to modifications of the second embodiment of the present invention has a structure substantially same as that of the contact 200C (see FIG. 21) according to the aforementioned second embodiment. Accordingly, components of the contact 200D, 200E shown in FIGS. 24 and 25 which are same as those of the contact 200C of the second embodiment are referred by using reference signs same as those of the contact 200C of the second embodiment.

As shown in FIG. 24, dissimilar to the contact 200C of the second embodiment, the contact 200D according to a modification has press-fit protrusions 413C, 430D, 422C and 435D. The press-fit protrusions 413C and 430D protrude outward from opposite ends, respectively, of an upper front wide portion 412C in the width direction. The press-fit protrusions 422C and 435D protrude outward from opposite ends, respectively, of an upper rear wide portion 421C in the width direction. Accordingly, the contact 200D is firmly held by the holding member 700C.

As shown in FIG. 25, dissimilar to the contact 200C of the second embodiment, the contact 200E of another modification has press-fit protrusions 430E and 435E. The press-fit protrusion 430E protrudes in the second orientation from an upper front wide portion 412C. The press-fit protrusion 435E protrudes in the second orientation from an upper rear wide portion 421C. Since the upper front wide portion 412C is firmly fixed to the holding member 700C also in the present modification, stress, which arises when a first support portion 300C is resiliently deformed in the up-down direction, is concentrated on a boundary portion between a second edge 304C of the first support portion 300C and the upper front wide portion 412C. Accordingly, the stress can be prevented from being concentrated on an upper front narrow portion 415C having a reduced size in the width direction. In the present modification, an end portion 414E, which faces the first orientation, of the upper front wide portion 412C is positioned beyond an upper bent portion 440C in the first orientation, and an end portion 423E, which faces the first orientation, of the upper rear wide portion 421C is positioned beyond the upper bent portion 440C in the first orientation.



Although the specific explanation about the present invention is made above referring to the embodiments, the present invention is not limited thereto and is susceptible to various modifications and alternative forms.

Although the connector body **110**, **110C** of the aforementioned embodiment comprises a plurality of the contacts **200**, **220C**, the present invention is not limited thereto. The number of the contact **200**, **200C** of the connector body **110**, **110C** may be one. In other words, the connector body **110**, **110A** may comprise at least one contact **200**, **200C**.

Although the press-fit protrusion is also provided on a part other than the upper front wide portion **412**, **412C** in the contact **200**, **200A**, **200B**, **200C**, **200D**, **200E** of the aforementioned embodiments, the present invention is not limited thereto. The press-fit protrusion may be provided only on the upper front wide portion **412**, **412C**.

Especially in the contact **200**, **200A**, **200B** of the present embodiments, the lower front wide portion **472** is fixed to the holding member **700**, and the bottom surface of the second support portion **320** is not brought into contact with the holding member **700**. The lower front wide portion **472** may, however, not be fixed to the holding member **700**, provided that the bottom surface of the second support portion **320** is brought into contact with and is received by the holding member **700**.

Although the upper front wide portion **412**, **412C** of the contact **200**, **200A**, **200B**, **200C**, **200D**, **200E** of the present embodiments is fixed to the holding member **700**, **700C** by being press-fit thereinto, the present invention is not limited thereto. It is sufficient that the upper front wide portion **412**, **412C** is fixed to the holding member **700**, **700C** so as to be immovable in the width direction. For example, the upper front wide portion **412**, **412C** may be fixed thereto by insert molding.

In the contact **200**, **200A**, **200B**, **200C**, **200D**, **200E** of the present embodiments, the upper main portion **410**, **410C**, the upper rear narrow portion **419**, **419C** and the upper rear wide portion **421**, **421C** are positioned in the same plane perpendicular to the up-down direction. The upper main portion **410**, **410C**, the upper rear narrow portion **419**, **419C** and the upper rear wide portion **421**, **421C** may, however, not be positioned in the same plane perpendicular to the up-down direction. Specifically, there may be a step between the upper main portion **410**, **410C** and the upper rear narrow portion **419**, **419C**, and there may be a step between the upper rear narrow portion **419**, **419C** and the upper rear wide portion **421**, **421C**.

In the contact **200**, **200A**, **200B** of the present embodiments, the lower main portion **470**, the lower rear narrow portion **479** and the lower rear wide portion **481** are positioned in the same plane perpendicular to the up-down direction. The lower main portion **470**, the lower rear narrow portion **479** and the lower rear wide portion **481** may, however, not be positioned in the same plane perpendicular to the up-down direction. Specifically, there may be a step between the lower main portion **470** and the lower rear narrow portion **479**, and there may be a step between the lower rear narrow portion **479** and the lower rear wide portion **481**.

While there has been described what is believed to be the preferred embodiment of the invention, those skilled in the art will recognize that other and further modifications may be made thereto without departing from the spirit of the invention, and it is intended to claim all such embodiments that fall within the true scope of the invention.

What is claimed is:

1. A connector mateable with a mating connector along a front-rear direction, wherein:
  - the connector comprises at least one contact and a holding member;
  - the holding member holds the at least one contact;
  - the at least one contact has a first support portion, a second support portion, a first contact portion, a second contact portion and a coupling portion;
  - each of the first support portion and the second support portion is resiliently deformable;
  - the first contact portion is supported by the first support portion;
  - the second contact portion is supported by the second support portion;
  - each of the first contact portion and the second contact portion is movable in an up-down direction perpendicular to the front-rear direction;
  - the first support portion has a first edge and a second edge in a width direction perpendicular to both the front-rear direction and the up-down direction;
  - the first edge faces a first orientation of the width direction;
  - the second edge faces a second orientation of the width direction;
  - the first orientation and the second orientation are opposite to each other in the width direction;
  - the coupling portion couples the first support portion and the second support portion with each other;
  - the coupling portion has an upper main portion and an upper bent portion;
  - the upper main portion has an upper front wide portion, an upper front narrow portion and an upper base portion;
  - the upper front wide portion is fixed to the holding member so as to be immovable in the width direction;
  - the first support portion extends forward from the upper front wide portion in the front-rear direction;
  - the upper front narrow portion is positioned between the upper front wide portion and the upper base portion in the front-rear direction;
  - the upper front narrow portion has an edge facing the first orientation;
  - the at least one contact has a first boundary portion between the first edge of the first support portion and the upper front wide portion in the front-rear direction;
  - the edge of the upper front narrow portion is positioned beyond the first boundary portion in the second orientation;
  - the upper base portion has an edge facing the first orientation;
  - the upper bent portion extends from the edge of the upper base portion and is bent downward;
  - the second support portion has a size in the width direction and another size in the up-down direction;
  - the size of the second support portion in the width direction is greater than the size of the second support portion in the up-down direction;
  - the second support portion is positioned below the first support portion in the up-down direction;
  - the coupling portion further has a lower main portion and a lower bent portion;
  - the lower main portion has a lower front wide portion, a lower front narrow portion and a lower base portion;
  - the second support portion extends forward from the lower front wide portion in the front-rear direction;



## 19

the lower front narrow portion is positioned between the lower front wide portion and the lower base portion in the front-rear direction;

in the width direction, the lower front narrow portion has a size smaller than a size of the lower front wide portion;

the lower front narrow portion has an edge facing the first orientation;

the second support portion has an edge facing the first orientation;

the at least one contact has a second boundary portion between the edge of the second support portion and the lower front wide portion in the front-rear direction;

the edge of the lower front narrow portion is positioned beyond the second boundary portion in the second orientation;

the lower base portion has an edge facing the first orientation; and

the lower bent portion extends from the edge of the lower base portion and is bent upward.

2. The connector as recited in claim 1, wherein:

the first support portion has a size in the width direction and another size in the up-down direction;

the size of the first support portion in the width direction is greater than the size of the first support portion in the up-down direction;

the upper main portion has a flat plate shape;

the upper front wide portion of the upper main portion has a press-fit protrusion protruding in the width direction;

the upper front wide portion has an end portion facing the first orientation; and

## 20

the end portion of the upper front wide portion is positioned beyond the upper bent portion in the first orientation.

3. The connector as recited in claim 1, wherein:

the at least one contact further has an upper rear wide portion and an upper rear narrow portion;

the upper rear wide portion is positioned rearward of the upper rear narrow portion in the front-rear direction;

the upper rear wide portion is fixed to the holding member so as to be immovable in the width direction;

the upper rear narrow portion is positioned between the upper base portion and the upper rear wide portion in the front-rear direction; and

in the width direction, the upper rear narrow portion has a size smaller than a size of the upper rear wide portion.

4. The connector as recited in claim 3, wherein:

the upper rear wide portion has an end portion facing the first orientation; and

the end portion of the upper rear wide portion is positioned beyond the upper bent portion in the first orientation.

5. The connector as recited in claim 1, wherein:

the upper main portion has an edge facing the second orientation; and

the edge of the upper main portion has a linear shape.

6. The connector as recited in claim 1, wherein:

the coupling portion further has a wall portion having a flat plate shape;

the wall portion couples the upper bent portion and the lower bent portion with each other; and

the wall portion intersects with the width direction.

\* \* \* \* \*